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APPRENTICESHIP TRAINING

Locksmith Program

Alberta
LEARNING
Apprenticeship and Industry Training

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Locksmith

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Apprenticeship and Industry Training System

Apprenticeship is post-secondary education with a difference. It helps ensure Alberta has a steady supply of highly-skilled employees, the foundation of our economy's future health and competitiveness.

Apprentices in more than 50 trades and crafts spend between one and four years learning their trade - 80% of the time on the job under the supervision of a certified journeyman or qualified tradesperson. The balance of the program is technical training in the theory, skills and technologies of their trade.

To become certified journeymen apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board (the Board) and a network of local and provincial industry committees.

The graduate of the Locksmith apprenticeship training is a journeyman who will be able to:

- apply the principles of Locksmithing.
- handle orders of locks, safes and allied equipment.
- operate and service the tools and machinery as used in the Locksmith trade.
- perform the installation of locks and allied equipment.
- identify the operation of locks and safes.
- identify and apply the principles of locking devices.
- identify and apply the principles of safes and allied equipment.
- identify municipal, provincial and federal statutes.
- apply in depth knowledge of codes and specifications.
- apply knowledge of master keying.
- identify and apply life safety codes and regulations.
- relate to other trades working in the same environment.

Apprenticeship and Industry Training Committee Structure

While government supports Alberta's apprenticeship and industry training system, it is driven by industry, a term which includes both employers and employees. The Alberta Apprenticeship and Industry Training Board, with the support of Alberta Learning, oversees the system. But the system relies on a network of industry committees. These committees include local and provincial apprenticeship committees (LACs and PACs) in the designated trades and occupational committees in the designated occupations, as well as other committees such as provisional committees established before the designation of a new trade or occupation comes into effect. All these committees are composed of equal numbers of employers and employees. The network of industry committees is the foundation of Alberta's apprenticeship and industry training system.

Local Apprenticeship Committees (LAC)

Wherever there is activity in a trade, the Board can set up a LAC. The Board appoints equal numbers of employees and employers for terms of up to three years. The committee appoints a member as presiding officer. Local Apprenticeship Committees:

- monitor the apprenticeship system, and the progress of apprentices in their trade, at the local level.
- help settle certain kinds of issues between apprentices and their employers.
- recommend improvements in apprenticeship training and certification to their trade's provincial apprenticeship committee.
- make recommendations to the Board regarding the appointment of members to their trade's PAC.

Provincial Apprenticeship Committees (PAC)

The Board establishes a PAC for each trade and, based on PAC recommendations, appoints a presiding officer and equal numbers of employees and employers for terms of up to three years. Most PACs have nine members. Provincial Apprenticeship Committees:

- identify the training needs and content for their trade.
- recommend to the Board the standards for training and certification for their trade.
- monitor the activities of local apprenticeship committees in their trade.
- make recommendations to the Board about the designation of trades and occupations.
- determine whether training of various kinds is equivalent to training provided in an apprenticeship program in the trade.
- may participate in resolving any apprenticeship-related disputes between employers and employees.

Locksmith PAC Members

Mr. P. Meagher	Edmonton	Presiding Officer
Mr. R. Cinq-Mars	Calgary	Employer
Mr. D. Kennedy	Calgary	Employer
Mr. W. Burkard	Edmonton	Employer
Mr. G. Nielson	Edmonton	Employer
Mr. T. Danieluk	Calgary	Employee
Mr. C. Smith	Calgary	Employee
Ms. M. Thomas	Edmonton	Employee
Mr. J. Cox	Edmonton	Employee

The Alberta Apprenticeship and Industry Training Board (Board)

The mandate of the Alberta Apprenticeship and Industry Training Board relates to the standards and requirements for training and certification in programs under the *Apprenticeship and Industry Training Act*. The Board provides advice to the Minister of Learning on the training and certification of people in designated trades and occupations and on the needs of the Alberta labour market for skilled and trained persons. The Board also makes orders and regulations respecting standards and requirements for apprenticeship programs and the training of apprentices and for training and certification in designated trades and occupations, and the criteria or requirements for granting and recognizing trade and other certificates.

The 13-member Board consists of a chairman, eight members representing trades and four members representing other industries. The trades and other industry members are equally represented by employer and employee representatives.

Safety Education

Safe working procedures and conditions, accident prevention and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees and the public. Therefore, it is imperative that all parties become aware of circumstances that may lead to injury or harm. Safe learning experiences and environments can be created by controlling the variables and behaviours that may contribute to or cause an accident or injury.

It is generally recognized that a safe attitude contributes to an accident free environment. Everyone will benefit as a result of a healthy, safe attitude towards prevention of accidents.

A tradesperson is possibly exposed to more hazards than any other person in the work force and, therefore, should be familiar with and apply the Occupational Health and Safety Act and Regulations dealing with personal safety and the special safety rules applying to each task.

Legal and Administrative Aspects of Safety

Accident prevention and the provisions of safe working conditions are the responsibilities of an employer and employee.

Employer's Responsibilities

The employer is responsible for:

- providing and maintaining safety equipment and protective devices.
- enforcing safe working procedures.
- providing safeguards for machinery, equipment and tools.
- observing all accident prevention regulations.
- training employees in the safe use and operation of equipment.

Employee's Responsibilities

The employee is responsible for:

- working in accordance with the safety regulations pertaining to the job environment.
- working in such a way as not to endanger themselves or fellow employees.

Workplace Health and Safety's Responsibilities:

Workplace Health and Safety (Alberta Human Resources and Employment) will conduct periodic inspections of the workplace to ensure that safety regulations for industry are being observed.

Technical Training Establishment

Alberta Learning, Apprenticeship and Industry Training offer your apprenticeship training program. Staff and facilities for delivering the program are supplied by Red Deer College.

Procedures For Recommending Revisions To The Course Outline

Apprenticeship and Industry Training, Industry Programs and Standards has prepared this course outline in partnership with the Locksmith Provincial Apprenticeship Committee.

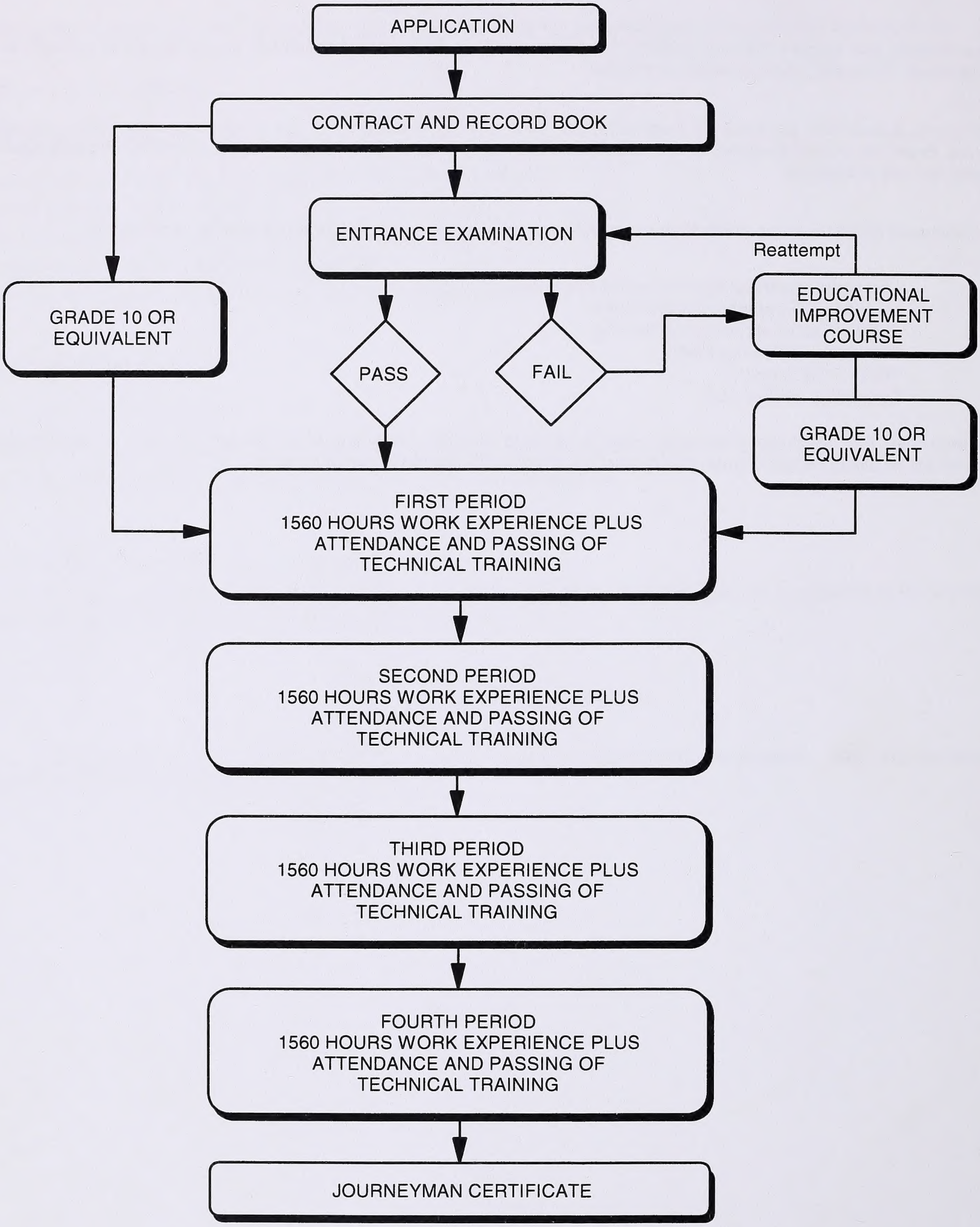
This course outline was approved on Septmeber 26, 2003 under the authority of the Alberta Apprenticeship and Industry Training Board on a recommendation from the Provincial Apprenticeship Committee. Valuable input is acknowledged from industry and the institutions.

Any concerned citizen or group in the Province of Alberta may make recommendations for change by writing to:

Locksmith Provincial Apprenticeship Committee
c/o Industry Programs and Standards
Apprenticeship and Industry Training
10th floor, Commerce Place
10155 - 102 Street
Edmonton, AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used. Recommendations received will be placed before regular meetings of the Provincial Apprenticeship Committee.

Apprenticeship Route Toward Certification


APPLICATION
CONTRACT AND RECORD BOOK
ENTRANCE EXAMINATION
Reattempt
GRADE 10 OR EQUIVALENT
PASS
FAIL
EDUCATIONAL IMPROVEMENT COURSE
GRADE 10 OR EQUIVALENT
FIRST PERIOD 1560 HOURS WORK EXPERIENCE PLUS ATTENDANCE AND PASSING OF TECHNICAL TRAINING
SECOND PERIOD 1560 HOURS WORK EXPERIENCE PLUS ATTENDANCE AND PASSING OF TECHNICAL TRAINING
THIRD PERIOD 1560 HOURS WORK EXPERIENCE PLUS ATTENDANCE AND PASSING OF TECHNICAL TRAINING
FOURTH PERIOD 1560 HOURS WORK EXPERIENCE PLUS ATTENDANCE AND PASSING OF TECHNICAL TRAINING
JOURNEYMAN CERTIFICATE

Locksmith Training Profile

FIRST PERIOD

(8 Weeks 30 Hours Per Week – Total of 240 Hours)

SECTION ONE

INTRODUCTION AND SAFETY
12 Hours

A	B	C
Introduction	Regulations – Occupational Health and Safety (O.H. & S.)	Safety
D	**E**	**F**
Introduction to W.H.M.I.S. (Workplace Hazardous Materials Information Systems)	Fire Prevention	Commercial Vehicles
G		
Glossary of Terms – As Per Latest Edition of A.L.O.A. "Alberta P.A.C. Approved"		

SECTION TWO

STOCK HANDLING PROCEDURES
6 Hours

A	B	C
Receiving	Warehouse Storage Procedures as related to the Locksmith Industry	Shipping and Invoicing Procedures Related to the Locksmith Industry

SECTION THREE

TOOLS AND MACHINERY
52 Hours

A	B
Tools (Theory)	Hand and Power Tool Operations

SECTION FOUR

KEYS, HARDWARE AND LOCKS
160 Hours

A	B	C
Keys (Theory)	Keys (Shop Practice)	Lock Cylinders (Theory)
D	**E**	**F**
Lock Cylinders (Shop Practice)	Padlocks	Cut First Key
G	**H**	**I**
Recombinant (Theory and Shop)	Hardware	Remove and Reinstall Locking Hardware
J	**K**	**L**
Repair and Service Locking Hardware	Lock Installation (New)	Open Secured Entry (Basic)
M		
Refinishing		

SECTION FIVE

MASTER KEYING (INTRODUCTION)
10 Hours

A
Basic Master Keying

SECOND PERIOD

(8 Weeks 30 Hours Per Week – Total of 240 Hours)

SECTION ONE

SALES AND COMMUNICATION
24 Hours

- A Verbal Communications
- B Relationship of Salesmanship and Personality
- C The Basics of Sale Techniques Related to the Locksmith Industry
- D Written Communication Skills and Techniques

SECTION TWO

KEYS, HARDWARE AND LOCKS (BUILDINGS ADVANCED)
60 Hours

- A Building Hardware (Advanced)
- B Advanced Installation (New)
- C Office Furniture
- D Service Other Builder's Hardware
- E Door Closers (Basic)
- F Open Secured Entry (Advanced)

SECTION THREE

MASTER KEYING (BASIC)
12 Hours

- A Review
- B Master Key Custom Planning
- C Charting
- D Co-ordination
- E Structure of Progression

SECTION FOUR

HIGH SECURITY LOCKS AND KEYS
24 Hours

- A High Security Principles
- B High Security (Practical)

SECTION FIVE

AUTOMOTIVE
120 Hours

- A Automotive Lock Servicing
- B Vehicle Opening
- C Anti-Theft Systems
- D Resource Materials
- E Automotive Service Procedures
- F Motorcycle, Marine Craft and Recreational Vehicles
- G Automotive Specialty Items

THIRD PERIOD

(8 Weeks 30 Hours Per Week – Total of 240 Hours)

SECTION ONE

ELECTRICAL THEORY
66 Hours

- A Principles of Electricity
- B Magnetism
- C Electrical Measuring Devices
- D DC Circuits
- E DC Sources
- F Electrical Lab

SECTION TWO

ELECTRICAL COMPONENTS AND HARDWARE
74 Hours

- A Electrical Components
- B Practical (Electrical Hardware)

SECTION THREE

DOOR CLOSERS (ADVANCED INSTALLATIONS)
18 Hours

- A Review
- B Installations

SECTION FOUR

MORTISE LOCKS (ADVANCED INSTALLATIONS)
25 Hours

- A Mortise Locks

SECTION FIVE

PANIC BARS (VERTICAL MOUNT)
18 Hours

- A Vertical Mount

SECTION SIX

MECHANICAL KEYLESS LOCKS
15 Hours

- A Theory
- B Practical

SECTION SEVEN

MASTER KEYING (ADVANCED)
24 Hours

- A Advanced Master Key System

FOURTH PERIOD

(10 Weeks 30 Hours Per Week – Total of 240 Hours)

SECTION ONE

OXYACETYLENE
30 Hours

A	B
Oxyacetylene Equipment	Metal Gas Arc Welding (GMAW)

SECTION TWO

SAFETY DEPOSIT BOXES
30 Hours

A	B	C
History	Theory	Keys
D	**E**	**F**
Opening of Safe Deposit Boxes	Repair (Locks)	Installations
G	**H**	
Verification	Troubleshooting	

SECTION THREE

SAFES AND VAULTS
40 Hours

A	B	C
History	Safety Precautions	Design and Construction
D	**E**	**F**
Labels and Rating (Theory)	Bolt Works	Relocking Devices
G	**H**	**I**
Hinges	Handles	Moving
J	**K**	**L**
Vault Specifics	Doors and Frames	Other Bank Equipment

SECTION FOUR

SAFE AND VAULT LOCKS
48 Hours

A	B	C
Key Locks	Combination Locks Identification	Wheel Design
D	**E**	**F**
Combination Locks Changing	Combination Locks Servicing	Combination Locks Repair
G	**H**	**I**
Manipulation Proof Locks	Electronic Locks	Time Locks

SECTION FIVE

SAFE AND VAULT ENTRY **36 Hours** ⇨

- A Safe Entry (Theory)
- B Troubleshooting Lockouts
- C Safe Penetration
- D Vault Penetration

SECTION SIX

NIGHT DEPOSITORY RECEIVERS **24 Hours** ⇨

- A Night Depository

SECTION SEVEN

CORRECTIONAL INSTITUTION LOCKS (JAILS) **12 Hours** ⇨

- A History
- B Theory
- C Related Hardware
- D Doors
- E Security
- F Electric Strikes
- G Practical

SECTION EIGHT

SECURITY MANAGEMENT (BASIC) **20 Hours** ⇨

- A Theory
- B Practical
- C Public Safety
- D Workplace coaching and Advisory Network

NOTE: The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.

FIRST PERIOD TECHNICAL TRAINING
LOCKSMITH TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS COURSE THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

Due to the nature of the work of the Locksmith, it is imperative that safety be taught on a continuous basis throughout the entirety of this course.

Special emphasis should be placed on weak areas of theory and shop that are evident from progressive tests and examinations administered throughout the course. The time required for such examinations and testing shall be allowed for in each area of instruction.

SECTION ONE: .... INTRODUCTION AND SAFETY .... 12 HOURS

A. Introduction

I. Program orientation

1. Attendance and deportment.
2. Reference books and study methods.
3. Apprenticeship Liaison Officer.

II. History

1. Describe the history of Locksmithing.

III. Scope of the industry—status and professionalism

1. Describe the total scope of the Locksmith industry for Alberta.
   a) education opportunities
2. Briefly describe the trades associations available to the Locksmiths. Professional Locksmith Association of Alberta (P.L.A.A.).
3. Be aware of other associations and resource groups:
   a) A.L.O.A. (Associated Locksmiths of America)
   b) D.H.I. (Door Hardware Institute)
   c) A.S.I.S. (American Society of Industrial Security)
   d) U.L.C. (Underwriters Laboratory Canada)
   e) A.N.S.I. (American National Standards Institute)
4. Describe the following procedures:
   a) professional ethics
   b) conduct
   c) appearance
   d) dress
   e) deportment
   f) knowledge of "what and what not" to say
   g) demonstrate to the customer, confidentiality

B. Regulations - Occupational Health and Safety (O.H. & S.)

I. Study of applicable regulations

1. Identify the legislation and regulations as they pertain to the work place.
2. Identify the role of Federal, Provincial and Municipal authorities:
   - a) codes
   - b) inspections
   - c) regulations
3. Demonstrate an ability to locate and interpret major sections of the O.H. & S. regulations.
4. Demonstrate through safe working practices:
   - a) first aid regulations
   - b) general accident prevention with emphasis on:
     - i) general safety precautions
     - ii) housekeeping, personal protective equipment, clothing
     - iii) guards
     - iv) grinding
     - v) operation of power tools and machines
5. Emergency procedures.
6. Identify procedures for obtaining assistance for injured workmen.
7. Procedures for obtaining first aid training certification.

C. Safety

I. Safety hazards

1. Identify potential hazards in a given situation:
   - a) poor housekeeping
     - i) blocked aisles
   - b) improper start up of machinery
   - c) horse play and practical jokes
   - d) loose clothing and apparel
     - i) neckties
     - ii) street shoes
     - iii) rings
     - iv) watches
     - v) pendants
     - vi) other ornamental objects
     - vii) long hair
   - e) air quality
     - i) ventilation
     - ii) fumes
   - f) water quality
   - g) open flames
   - h) storage and handling of gas cylinders
     - i) properties of propane gas
     - ii) properties of natural gas
   - i) handling and operating electrical equipment
   - j) operating pneumatic equipment
   - k) compressed air-hazards
   - l) noise/induced hearing loss
   - m) asbestos

D. Introduction to W.H.M.I.S. (Workplace Hazardous Materials Information System)

NOTE: No additional time will be allotted to this introduction, it will be incorporated with other safety items.

NOTE: An introductory film is available regarding W.H.M.I.S. from Occupational Health and Safety.

1. Describe what W.H.M.I.S. is, its rational and major elements.
2. Define what is meant by a W.H.M.I.S. label and distinguish between supplier and workplace labels and other means of identification.
3. Describe what is meant by the following classifications:
   a) prohibited product
   b) restricted product
   c) controlled product
4. Explain what a Material Safety Data Sheet (MSDS) is, its purpose and limitations.
5. Describe the roles and responsibilities of employer, supplier and worker in the education of workers.
6. Other subject areas as deemed appropriate and deliverable by the training establishment.

E. Fire Prevention

I. Three elements of combustion

1. List the elements of combustion:
   a) oxygen
   b) heat
   c) light
2. List the correct emergency fire procedures for a given situation.

II. Basic classes of fires and extinguishers

1. List the classes of extinguishers and describe their contents and uses:
   a) Class A
   b) Class B
   c) Class C
   d) others
2. Describe the various classes of emergency fire extinguishers for each class of fire.

III. Failure or delinquent reporting of fire equipment being used

1. List the danger of not reporting used extinguishers.
2. Explain the reasoning for reporting spent extinguishers.

IV. Fire extinguisher operation

1. Demonstrate safe operating procedures of the various classes of extinguishers.

V. Fire hazards

1. Identify fire hazards.

VI. Inspections

1. Ensure fire extinguishers are regularly inspected.

F. Commercial Vehicles

1. Identify the requirements of a commercial vehicle:
    - a) safe operating condition (walk around)
        - i) lights
        - ii) tires
        - iii) wipers
    - b) operation
        - i) brakes (safety)
        - ii) steering (safety)

2. Identify equipment that must be in the vehicle:
    - a) fire extinguisher
    - b) flares
    - c) first aid kit
    - d) other requirements

3. Identify the requirements of vehicle accident reporting.

G. Glossary of Terms - As Per Latest Edition of A.L.O.A. "Alberta P.A.C. Approved"

SECTION TWO:..STOCK HANDLING PROCEDURES...6 HOURS

A. Receiving

I. Inspection of shipments as it relates to Locksmith industry

1. List the steps involved in receiving an order from delivery to inventory including special conditions, i.e. back orders, shortages, overages and damaged items:
    - a) damaged containers
    - b) claims procedures
    - c) handling specially marked containers

2. Packing list procedures:
    - a) shortages
    - b) factory back orders
    - c) number of pieces
    - d) use of suitable records for receipt of shipments
    - e) proper marking of tags and cards

3. Recognition of items:
    - a) correct identification
    - b) tagging and marking
    - c) handling unidentified items
    - d) accuracy of item counting (especially high count items)
    - e) sorting procedures
    - f) importance of correct terminology

4. Recognition and proper use of forms:
    - a) damage and shortage claims
    - b) entries and signatures
    - c) customs and brokerage procedures
    - d) way bills
    - e) invoices
    - f) receipts
    - g) relationship of proper receiving to inventory control
    - h) determining the proper flow pattern and routine

- i) raising debit notes to supplier re: shortages, etc.

B. Warehouse Storage Procedures as Related to the Locksmith Industry

I. Storage by classification
  a)—hard goods
  b)—speed of movement

1. Identify and describe by listing proper warehouse and/or storage procedure as it pertains to the Locksmith industry.

II. Recognition and awareness of advantageous location of specific item for materials in the warehouse

1. Describe the advantages and disadvantages of proper and improper warehousing:
   - a) item movement considerations
     - i) fast moving
     - ii) rotational
     - iii) seasonal
     - iv) overstock
   - b) handling of item considerations
     - i) bulk
     - ii) promotional
     - iii) factory returns
   - c) proper use of shelves, bins and bulk area
     - i) efficiency
     - ii) safety
     - iii) protective considerations (height and depth factors)

C. Shipping and Invoicing Procedures Related to the Locksmith Industry

I. Proper procedures for the incoming order, according to form
   - a) mail
   - b) telex
   - c) telephone
   - d) fax machine

2. List the steps involved from receiving an incoming order to the shipping of the complete order:
   - a) wholesale
   - b) retail

3. Demonstrate the proper method of assembling orders as it relates to the Locksmith industry:
   - a) interpretation of prescribed:
     - i) labour and material economics
     - ii) avoiding unnecessary backorders and duplication
     - iii) responsibility assignments

4. Sorting items in relation to packing methods; identify and describe proper sorting methods and concerns prior to warehousing:
   - a) fragiles - marking as such
   - b) selection of packing methods
     - i) in relation to transportation method
     - ii) handling frequencies
     - iii) labelling

5. Recognition and proper use of forms; identify and describe the various forms used in shipping and invoicing:
   - a) work orders
   - b) invoices
   - c) waybills
   - d) packing lists (slips) - identification of location

- e) handling C.O.D. shipments
- f) shipping instructions as to:
  - i) transportation method
  - ii) route and distribution points
  - iii) consignee notification
- g) shipment description and labelling
  - i) "collect"
  - ii) check-off method 1 of 6, 3 of 7, etc.
- h) provision for tracing shipments (shipment logs)

6. Recognition of routing procedures; identify the best shipping methods as required:
   - a) calculation of discounts, totals, weights and measures

7. Interpretation of transportation rates and schedules.

8. Safe shipping practices; identify and describe by listing proper shipping practices:
   - a) identification labelling
     - i) fragiles
     - ii) weight
     - iii) recommended handling methods (use no hooks) etc.
   - b) shipping positions (do not stack) etc.

SECTION THREE: .... TOOLS AND MACHINERY ....52 HOURS

A. Tools (Theory)

I. Types, function and use of basic hand tools

1. Recognize, select and use the proper hand tools for a given task safely and efficiently:
   - a) hammers
   - b) pliers
   - c) punches – assorted
     - i) double "D" punches
   - d) screw drivers (hand and cordless)
     - i) common flat
     - ii) Phillips
     - iii) Robertson
     - iv) Torx
     - v) tamper resistant
   - e) wrenches
     - i) open end
     - ii) box end
     - iii) Allan wrenches
     - iv) nut drivers
   - f) sockets and handles
     - i) imperial
     - ii) metric
   - g) saws
     - i) hacksaw
     - ii) key hole saw
   - h) holding devices
     - i) vises
     - ii) clamps
     - iii) V blocks
     - iv) vise grips
     - v) drill jigs
   - i) files
     - i) mill bastard
     - ii) fine file

- iii) single cut
- iv) smooth file
- v) warding file

j) measuring devices
- i) ruler or tape measure
- ii) tri square
- iii) callipers
- iv) micrometer
- v) vernier micrometer
- vi) depth gauges

k) taps and dies
- i) imperial
- ii) metric

l) chisels
- i) types
    - metal
    - flat
    - cape
    - cold
    - diamond point
    - rivet buster
    - others
    - wood
    - flat
    - mortising
    - cold

m) easy outs
- i) spiral
- ii) drive type pop rivet gun
- iii) rivet nuts

II. Machines and power tools

1. Identify and describe the safe operation, application and regular maintenance for the following list of equipment:

a) drills (power and cordless)

b) bench and angle grinders

c) drill press

d) saws
- i) jig
- ii) hole
- iii) power circular
- iv) cut-off

e) routers

f) special router with mortise jig attachment

g) buffers

h) die grinders and rotary files

i) portable hand/belt sanders

j) drills bits
- i) twist drills
    - fractional
    - number
    - letter
    - metric
    - other

III. Special Locksmith tools and equipment

1. Identify and describe the safe operation, application and regular maintenance for the following list of equipment:

a) key machines

b) clippers

c) lock tools

d) lock picks

- e) pick guns
- f) followers
- g) tweezers
- h) plug holders
- i) flash light
- j) auto opening and service tools
- k) stamps
  - i) number
  - ii) letter
  - iii) stamping machines
- l) installation jigs
- m) impressioning files

2. Identify types of lubricants used for maintenance of hand and power tools and equipment.

IV. Types, function and use of cleaning equipment

1. Demonstrate and describe the safe and efficient use of cleaning equipment:
   - a) air hoses and nozzles
   - b) water hoses and nozzles
   - c) cleaning solvents
   - d) steam cleaning
   - e) ultrasonic cleaner

B. Hand and Power Tool Operations

I. Saw

1. Describe and demonstrate the following objective for saws:
   - a) blade condition
   - b) blade selection
   - c) stance and balance
   - d) stroke technique
     - i) speed
     - ii) length
     - iii) pressure (on forward stroke)
     - iv) pressure (release on return stroke)
   - e) starting a cut
   - f) completing a cut
   - g) special techniques
     - i) thin materials
     - ii) soft materials
   - h) special frame types
   - i) special blade positions and applications
   - j) lubricants
   - k) safety

II. Vise

1. Describe and demonstrate the following objectives for vises:
   - a) types and purpose
     - i) plain
     - ii) swivel base
     - iii) quick action
     - iv) drill press vises
   - b) methods of holding work in vise
     - i) regular shapes
     - ii) irregular shapes
     - iii) round stock
     - iv) thin walled pipe

- c) holding of thin materials
- d) holding of soft materials
- e) types and uses of soft jaws
- f) safety

III. Files

1. List, describe and demonstrate the following objectives for files:
    - a) file selection
        - i) cut
        - ii) shape
        - iii) grade
    - b) filing techniques
        - i) stroke speed
        - ii) pressure distribution
        - iii) releasing pressure to clear file
        - iv) reduction of chattering, squealing, etc.
    - c) types and use of handles
    - d) filing applications
        - i) to reduce size
        - ii) to secure finish
        - iii) to secure accuracy (shape and size)
        - iv) to lay-out patterns
    - e) draw filing
        - i) method
        - ii) purpose
    - f) use of file cards
    - g) care of files
    - h) effects of choked file
    - i) use of chalk
    - j) safety

IV. Hammers, punches and stamps

1. Effects of hammer blows (warping, twist, etc.).

2. Accuracy of centre punch point.

3. Condition of striking surface (mushroom head).

4. Proper use of identification stamps.

5. Safe use of hammers and punches.

V. Drills and drilling

1. Describe and demonstrate the following objectives for drills and drilling process:
    - a) drill size identification
    - b) drill material identification
        - i) carbon
        - ii) high speed
        - iii) special
    - c) sharpening and re-conditioning
        - i) recognition of angles
    - d) determining tap drill sizes
    - e) relationship of drill size to speed of rotation
    - f) lubricants
    - g) safety regulations
    - h) drill speed adjustments
    - i) use of holding devices
    - j) adjusting and use of depth control gauges
    - k) drill break through when hole is drilled
    - l) removing broken drills

- m) drilling with hole saw
- n) safety

VI. Chisels

1. Describe and demonstrate the following objectives for chisels:
    - a) re-conditioning
        - i) correct angles for chisel type
        - ii) removing flare (mushroom)
        - iii) removing burrs etc., from chisel shank caused by holding with pliers etc.
    - b) chisel and hazards
        - i) mushroom head
        - ii) improper hardening (manufacture)
    - c) uses and correct method of holding
    - d) safety

VII. Taps and dies

1. Describe and demonstrate internal threading
    - a) determining tapping hole size
    - b) recognition of thread types
    - c) recognition and application of:
        - i) taper tap
        - ii) plug tap
        - iii) bottoming
    - d) tapping techniques
        - i) straight start
        - ii) necessity and methods of removing chips
        - iii) results of a chipped tap
    - e) handles
        - i) types
        - ii) other uses (reamers)
    - f) lubrication (cutting oils)
    - g) thread chasers
    - h) safety

2. Describe and demonstrate external threading
    - a) Basic techniques:
        - i) removing chips
        - ii) lubrication

    - b) Common types:
        - i) adjustable
        - ii) non-adjustable
    - c) Determining thread depth.

3. Demonstrate the proper and safe use of easyouts.

4. Demonstrate the proper and safe use of pop rivet guns.

5. Demonstrate the proper and safe use of rivet nuts.

VIII. Measuring devices

1. Describe and demonstrate the following objectives for measuring and lay-out:
    - a) use of rigid steel rule, machinist's
    - b) use of squares
        - i) set square
        - ii) machinist's square
    - c) use of micrometers
    - d) use of protractors
    - e) use of straight edge
    - f) units of measurement

    - g) use of depth gauges
    - h) vernier micrometers
    - i) calipers
        - i) inside
        - ii) outside
  - 2. Identify and describe transfer of measurements:
    - a) use of dividers
  - 3. Identify and describe use of calipers:
    - a) inside
    - b) outside
  - 4. Identify and describe use of scribe.
  - 5. Identify and describe use of prick punch.

IX. Locksmith special tools

  - 1. Describe and demonstrate the proper use and safety of the following special tools:
    - a) key machines
    - b) bench grinders
    - c) buffers
    - d) die grinders
    - e) clippers
  - 2. Describe and demonstrate the proper maintenance, set up and servicing of the following:
    - a) key machines
    - b) key machine cutters
    - c) bench grinders
    - d) buffers
    - e) die grinders
    - f) clippers
  - 3. Demonstrate the use of installation jigs.

X. Springs

  - 1. Demonstrate the methods of making springs:
    - a) flat
    - b) compression
    - c) expansion

XI. Shop project

  - 1. Make tap and drill gauge or similar project.

SECTION FOUR: .... KEYS, HARDWARE AND LOCKS...160 HOURS

A. Keys (Theory)

I. Theory of keys

  - 1. Describe the operation and function of keys:
    - a) bit key
    - b) barrel key
    - c) skeleton key
    - d) paracentric key

II. Identification

  - 1. Identify keys by any one or more of the following:

- a) visual
- b) parts
  - i) bow
  - ii) blade
    - length
    - thickness
  - iii) shoulder
  - iv) tip
  - v) grooving
- c) manufacture
- d) materials
  - i) brass alloys
  - ii) various alloyed steel, nickel, etc.
  - iii) aluminum
  - iv) plastic
  - v) others
- e) use of "go no go" method
- f) key encyclopedia
- g) cross reference

III. Cutting theory

1. Comprehend the theory of key cutting.
   - a) what a proper cut key should look like

2. Describe the reasoning for the following:
   - a) angle
   - b) depth
   - c) spacing
   - d) maximum adjacent cut specifications

IV. Duplication theory by hand

1. Comprehend the theory of key duplication by hand.

2. Describe the following methods of duplication by:
   - a) hand method
     - i) filing
       - -smoke method
       - -sight

V. Verification (theory)

1. Verify a duplicated key by:
   - a) micrometer or calipers
   - b) "go-no-go" method
   - c) sight

2. Verify (approximate) every 10 keys on a large key order.

VI. Duplication theory of key cutting machine

1. Describe the operation of the various key cutting machines and their limitations:
   - a) manual
   - b) semi automatic
   - c) automatic
   - d) tubular
   - e) bit and flat steel
   - f) others

2. Define all safety factors of the various machines.

3. Describe the straight versus tilting feed.

4. Describe the proper mechanics of cutting keys.

B. Keys (Shop Practice)

I. Duplication by hand

1. Demonstrate the ability to use the cutting tools required in a safe and proper manner.
2. Demonstrate the proper method of duplicating keys by hand.
3. Demonstrate the ability to duplicate the following types of keys to test specifications:
   a) paracentric
   b) lever
   c) bit
   d) double sided
   e) others

II. Verification

1. Demonstrate the proper methods of verification using:
   a) micrometer or calipers
   b) comparison (sight)
   c) "go-no-go" method

III. Duplication of keys by cutting machines

1. Demonstrate the ability to operate the various machines with safety, efficiency and accuracy.
2. Demonstrate the ability to cut the various types of keys:
   a) paracentric
   b) tubular
   c) lever
   d) bit
   e) double sided
   f) others

C. Lock Cylinders (Theory)

I. Identification

1. Identify the various types of lock cylinders and describe their differences and function:.
   a) mortise
   b) rim
   c) I.C. core
   d) key in knob
   e) disk
   f) wafer
   g) warded
   h) lever
   i) high security
   j) cam lock
   k) bicentric
   l) tubular
   m) profile
   n) special purpose cylinder
   o) construction cylinder
   p) hotel cylinder
   q) others

II. Parts

1. Identify the various parts in exploded view for each lock cylinder previously described.

III. Theory of lock cylinders

1. Describe each of the parts as previously listed and their operation.
   a) sheer lines
   b) mechanics

2. Describe the function of each of the parts identified.

3. Describe the application of each part and the relationship to each other.

4. Describe the differences of each type of lock cylinder and how they accomplish a similar function.

D. Lock Cylinders (Shop Practice)

I. Disassemble and assemble

1. Demonstrate the ability to disassemble in sequence as per manufacturers exploded view.

2. Demonstrate the ability to identify the various components.

3. Demonstrate the assembly sequence.

4. Demonstrate the test procedure for reassembly.

5. Demonstrate the ability to generate keys for the following lock cylinders:
   a) Medecco
   b) Miwa
   c) Kaba
   d) Emhart
   e) Assa
   f) Primus
   g) Sargent Keso
   h) Com
   i) Mul-T-Lock

E. Padlocks

I. Identification

1. Identify the various types of padlocks:.
   a) warded
   b) pin tumbler
   c) lever
   d) combination
   e) disk

II. Theory

1. Describe the theory of operations for each type of padlock.

2. Describe the locking functions:
   a) single toe
   b) double toe and heal
      i) latch
      ii) ball bearing

III. Cylinder removal

1. Explain how to remove the cylinder and disassemble (if possible) the following types of padlocks:
    - a) warded
    - b) pin tumbler
    - c) lever
    - d) combination
    - e) disk

IV. Operation

1. Describe the operation of each of the previously listed types.

2. Describe the uses and limitations of each of the previously listed types.

V. Security classifications

1. Identify the distinctions of each padlock by:
    - a) material
        - i) solid brass
        - ii) hardened steel
        - iii) alloys
        - iv) aluminum
        - v) stainless steel
        - vi) other materials
    - b) locking mechanisms
        - i) uses and limitations
            - -toe or heal
            - - toe and heal
            - - latch
            - - ball bearing
    - c) function(s)
        - i) key retaining
        - ii) long shackle
        - iii) special shackle
        - iv) special bodies
        - v) weather protectors

VI. Shop practices

1. Disassembly and assembly of padlocks and demonstrate the proper methods of:
    - a) repair
    - b) maintenance
    - c) cleaning
    - d) exchange shackles
    - e) re-key
    - f) recombinate

F. Cut First Key

I. Theory

1. Describe the procedure of cutting first key (pin tumbler):
    - a) pick and read
    - b) by code number
    - c) read only
    - d) impressioning

II. Disassemble (theory)

1. Know how to disassemble locks by the proper sequence using:
    - a) keys

- b) rapping method
- c) picking
- d) shimming
- e) persuasion
- f) find retainer
- g) other

III. Examination

1. Examine all parts in comparison to exploded views.

2. Examine and evaluate all parts for wear and proper operation.

IV. Manufacture key

1. Make first key by: **NOTE:** Be aware of the use of computerised key code machines.
   - a) decoding pin tumbler
     - i) standard
     - ii) tubular
     - iii) cut by code machine
   - b) cut by depth keys
   - c) cut key by using first key, key machine
   - d) file by hand to existing lock combination
     - i) pin tumbler cylinder
     - ii) Schlage wafer
     - iii) double sided wafer (Illinois)
     - iv) single sided wafer (cam locks)
     - v) lever locks (mailbox, lockers)
     - vi) bit and barrel locks
   - e) file key by sample picture
     - i) double sided wafer
     - ii) flat steel (lever)
     - iii) bit and barrel
   - f) impressioning

V. Assemble cylinder

1. Reassemble by:
   - a) loading top chamber
   - b) installing the plug
   - c) reassemble plug retainer
   - d) lubricate all parts as required
   - e) check key operation

- i) turning of key
- ii) proper key removal

VI. Troubleshooting

1. Know the proper process and steps for troubleshooting:
    - a) problems with each type of lock
    - b) procedures
    - c) remedies
    - d) repairs

VII. Shop (practical)

1. Demonstrate your ability to disassemble, fit the first key, and reassemble each of the following lock types:
    - a) warded
    - b) Schlage wafer
    - c) cam lock wafer
    - d) double sided wafer
    - e) tubular lock
    - f) pin tumbler
    - g) lever
        - i) mailbox
        - ii) locker
    - h) bit or barrel
    - i) profile cylinder
    - j) other

G. Recombinant (Theory and Shop)

1. Change combination
    - a) pin tumbler
    - b) wafer/disk
        - i) lever
        - ii) profile
        - iii) tubular

2. Identify original code.

3. Set lock sample keys, factory precut.

4. Generate a new code.
    - a) by hand
        - i) rearrange tumblers
        - ii) install new tumblers

5. Identify proper stack as per manufacturer's specifications.

6. Identify a master key cylinder.

II. Practical (shop)

1. Demonstrate the ability to reassemble and reinstall.

2. Demonstrate the ability to recombinate:
    - a) by hand
        - i) re arrange tumblers
        - ii) install new tumblers

III. Verification

1. Demonstrate the various methods of verification:
    - a) sight method
    - b) use new key against old key

- c) ensure all components operate properly

H. Hardware

I. Identification

1. Use manufacturer's catalogues and exploded views.
2. Describe the function of hardware.
3. Describe how to determine the hand of a door and how it applies to various types of hardware.
4. Demonstrate how to identify hardware.
5. Demonstrate how, where and what to order using resource material:
    - a) key blank encyclopaedia
    - b) catalogue - for
        - i) styles
        - ii) functions
            - panic bars
            - mortise
            - cylindrical
    - c) finish
    - d) fire rated
    - e) U.L.C. rated
    - f) back set
    - g) door thickness
    - h) trim

II. Door components

1. Properly identify doors and components:
    - a) active leaf
    - b) inactive leaf
    - c) co-ordinator
    - d) astragal
    - e) kick plates
    - f) mop plates
    - g) U.L.C. ratings
        - i) handles
        - ii) hinges
    - h) door closers
        - i) fire
        - ii) life
        - iii) safety
    - i) door construction
        - i) steel
        - ii) wood
    - j) protective devices
        - i) astragals
        - ii) blockers
        - iii) hardened trim rings
        - iv) removable mullion

I. Remove and Reinstall Locking Hardware

I. Remove

1. Remove lock assembly as per manufacturer's instructions for the following applications:
    - a) basic hardware

   - i) residential application
   - ii) light duty commercial application

2. Remove from source without inflicting any damage.

II. Reinstall

1. Reinstall lock assembly as per manufacturer's instructions for the previously listed applications.
2. Demonstrate the ability to install without inflicting any damage.

III. Verification

1. Demonstrate the ability to verify that all work previously completed was to manufacturer's specifications and are in proper working order.

J. Repair and Service Locking Hardware

I. Troubleshooting

1. Make accurate diagnosis at source prior to removal.

II. Disassemble

1. Demonstrate the ability to disassemble in proper sequence as per manufacturer's instructions.
2. Demonstrate how to lay out as per exploded view.

III. Diagnosis

1. Demonstrate the ability to diagnose any visual problems.

IV. Repair

1. Repair as per diagnosed problems with correct manufacturers' parts.

VI. Service and maintenance

1. Demonstrate the ability to follow manufacturer's service policies.
2. Use manufacturer's recommended lubricant and amounts.

K. Lock Installation (New)

I. Installation (theory)

1. Install, following manufacturer's specifications.
2. To know the proper tools for installation of the following:
   - a) cylindrical
     - i) key in knob
     - ii) dead bolt
     - iii) simple drawer locks
     - iv) push cam locks in wood
     - v) door viewers

II. Procedure to install (practical)

1. Follow proper procedure for installation:
   - a) back set
   - b) strike plates

2. Demonstrate the use of correct tools for installation of previously listed theory items.

NOTE: Measure twice, cut once

L. Open Secured Entry (Basic)

I. Authorization

1. Obtain proper authorization prior to opening entry:
   - a) proof of
     - i) ownership
     - ii) legal entitlement

II. Entry (basic)

1. Demonstrate entry of locked doors, etc. by:
   - a) key or combination
   - b) picking
   - c) shimming (cheating latch)
   - d) spreading frame
   - e) weak points of hardware
   - f) tool application
   - g) key sight reading
   - h) impressioning
   - i) rapping

2. Demonstrate entry of:
   - a) incorrectly installed locks
   - b) damaged or vandalised
   - c) disconnected
   - d) binding doors and hardware
   - e) broken key

3. Demonstrate entry of various types of locking devices:
   - a) mortise – rim
   - b) panic exits
   - c) Adam rite
   - d) file cab
   - e) key in knob
   - f) pin tumbler
   - g) wafer

M. Refinishing

1. Identify and describe the ability to refurbish by:
   - a) painting
     - i) blocker
     - ii) mullions
     - iii) fabricated parts
   - b) refurbishing

SECTION FIVE: ....MASTER KEYING (INTRODUCTION)..10 HOURS

A. Basic Master Keying

I. Principle

1. Understand the basic principles of master keying and terminology.

II. Security

1. Recognize the security aspect.
2. Prevent destruction of security.
3. Maintain security.

III. Pinning

1. Pin cylinders to:
    a) standard key coding
    b) pinning to sub masters
    c) read bitting list
    d) know when to ask for help

SECOND PERIOD TECHNICAL TRAINING
LOCKSMITH TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS COURSE THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: ....SALES AND COMMUNICATION..24 HOURS

A. Verbal Communications

I. Accomplishing effective two-way conversation

1. Demonstrate the principles of effective communication:
   - a) reading
   - b) listening
   - c) writing
   - d) making a short verbal report

II. Maintaining effective dialogue

1. Demonstrate how to put these skills into practice:
   - a) basic techniques
     - i) vocabulary development
     - ii) proper grammar
     - iii) voice inflection
   - b) establishing confidence
   - c) motivation for dialogue
     - i) sales motivated
     - ii) detailed instruction
     - iii) customer assistance
   - d) personalities and communication techniques

III. Communication skills in personal relations (oral and written)

1. Demonstrate the principles of effective written communication.
   - a) effective direction, guidance and supervision
   - b) adjudication and arbitration situations
   - c) awareness of employer's view points in the hiring process
     - i) employee (what is the employer really looking for)
     - ii) when qualifications become secondary to personal attributes

IV. Interpersonal communication

1. Describe two way communication from all levels between:
   - a) employer and apprentice
   - b) employee - employee
   - c) journeyman - apprentice

B. Relationship of Salesmanship and Personality

I. What to avoid in the selling occupation

1. Learn to communicate effectively and positively:
   - a) defensive attitudes

b) derogatory reference to competitor products
c) stereotyped dialogues
    i) "eh?"
    ii) "okay?"
    iii) "y'know"
d) lack of development of the conversational skills
e) offensive deportment
    i) shallow understanding
    ii) aloofness
    iii) language deficiencies

II. Responsibilities of sales staff

1. Describe sales staff responsibilities:
    a) accountability
    b) accessibility
    c) stability
    d) punctuality

III. Rudiments of selling a service

1. Describe the basics:
    a) basic knowledge of the problems pertaining to the service area (analysis service, reconditioning service, etc.)
    b) depth of follow-up on the sale of a service

IV. Professional ethics

1. Describe what is meant by "professional ethics" as it relates to the Locksmith industry.
    a) to pursue his professional work in the spirit of fairness to his client, with fidelity to security in conformance with appropriateness, and with high ideals of personal honor
    b) to properly and impartially analyze security problems receiving his attention and to advance the possible solution for the protection of his client
    c) to conduct himself in a dignified manner; to avoid using any improper or questionable methods of soliciting professional work and to decline to pay or accept remuneration from such incompatible patronage
    d) to refrain from associating himself with or allowing the use of his name by any enterprise of questionable character, or in any manner
    e) to cooperate in advancing the best interest of the Locksmithing industry by interchange of general information and experience with his fellow locksmiths
    f) to encourage and promote loyalty for his craft and interest himself in public welfare, always ready to apply his special knowledge, skill and training for the use and betterment of his craft

C. The Basics of Sale Techniques as Related to the Locksmith Industry

I. Importance of personal talents

1. Describe the basic sales techniques as they pertain to personal talents (knowledge).

II. Relationship of selling abilities to personal interests

1. Demonstrate sale techniques using personal qualities.

III. Development of effective traits and talents (techniques)

1. Demonstrate how effect personal traits can be:
    a) positive
    b) negative

IV. Basic sale psychology

1. Describe basic sales methods:
    a) methods of motivating interests

- b) using "objections" to an advantage
- c) recognition of the extent and position of the customers relative knowledge and experience (avoiding "talking down to")
- d) effective use of the common interest factor

V. Identification of selling requirements as they relate to the Locksmith industry

1. Describe and demonstrate selling requirements:
   - a) confidence
   - b) effective application of specific situations
     - i) seasonal situations
     - ii) particular interest situations
     - iii) recognition of the potential of causal inquires
     - iv) setting up the related sale situation
     - v) terminating a nonproductive argumentative situation
     - vi) coping with the "product comparison" situation
     - vii) fostering the "definite requirement" situation
     - viii) determining the "hard sell/soft sell" options of approach
   - c) importance of the basic concepts
     - i) product knowledge; own and competitors (for comparison only)
     - ii) modest confidence
     - iii) pitfalls of extravagant claims
     - iv) recognition of product (or service) limitations
     - v) matching the customer to the sale item
   - d) matching the product and its selling aspects
     - i) economy
     - ii) safety
     - iii) quality
     - iv) performance
     - v) appearance
     - vi) usefulness
     - vii) durability

VI. Recognition of sales leads

1. Describe how to acquire and retain sales leads:
   - a) personnel
     - i) repeats
     - ii) referrals
     - iii) related sale
   - b) direct inquiries
     - i) resulting from campaigns
     - ii) product introduction
     - iii) product reputation

VII. Techniques of "closing" a sale

1. Demonstrate the technique of "closing" a sale:
   - a) discussion review
     - i) summary and emphasis
     - ii) agreement on sales conditions, including warranties or after sales service (or entitlements)
   - b) advantages of personality factors in closing a sale
   - c) anticipating sale closing difficulties
   - d) recognition of the difficulties
   - e) equating the value of the sale to the cost of making the sale (man-hours space and equipment use; demonstration, etc.)

VIII. Accepting verbal orders

1. Demonstrate how to transfer verbal orders:
   - a) proper vocalizing
   - b) processing verbal orders

c) follow up

D. Written Communication Skills and Techniques

I. Organization and execution of written communication

1. Describe how to organize written communication:
    - a) work orders, invoices and quotations
    - b) importance of correct emphasis
    - c) importance of clarity
    - d) what, when, where , who, why and how

II. Value of planning written communication

1. Describe the value of planning:
    - a) setting the objective or intent
        - i) inquiry
        - ii) explanation
        - iii) request
        - iv) instruction
    - b) phraseology and slang expressions

III. Merchandising as a continuum

1. Describe the advantages of good attitudes and locations:
    - a) attitudes and appearance of employees
    - b) condition and location of display areas
    - c) value of timely and current merchandising themes
    - d) impact and originality of displays and materials

SECTION TWO:........................ KEYS, HARDWARE AND LOCKS (BUILDINGS ADVANCED) ....60 HOURS

A. Building Hardware (Advanced)

I. Review

1. Review first period keys, hardware locks.

II. Identification

1. Demonstrate the ability to determine the correct type of locks used in various door applications.

2. Demonstrate the ability to properly use catalogues and supply lists.

III. Removal (theory)

1. Describe the methods used for removal of various lock types.

2. Describe the complete workings of a lock assembly as per manufacturer's exploded views:
    - a) key in knob
    - b) mortise
    - c) rim lock (jimmy proof)
    - d) panic bars
    - e) dead bolts

IV. Removal (practical)

1. Demonstrate the ability of diagnose locking problems or symptoms.

2. Demonstrate the ability to remove the above named types of locks from existing doors.

V. Repair (practical)

1. Demonstrate the ability to disassemble as per manufacturer's exploded view.
2. Demonstrate the ability to evaluate the problem in relation to repair or replace.
3. Demonstrate the ability to repair and reassemble as per manufacturer's specifications.
4. Demonstrate the various methods of verification to ensure proper operation.

VI. Re-Installation

1. Demonstrate the ability to install in door assembly.
2. Verify that the installation is correct.
3. Verify the proper operation of the complete door and locking mechanism.

B. Advanced Installation (new)

I. Identification

1. Appraise what hardware (locks etc.) is required for the various door applications in relation to:
   a) manufacturer's specifications
   b) architect requests
   c) special circumstances

II. Theory

1. Identify the proper tools required to complete an installation:
   a) hand tools
   b) power tool
   c) special tool
      i) jigs
   d) others

2. Determine the special requirement of doors, frames, locks and hardware:
   a) internal or perimeter
   b) wood, metal or arborite
   c) special coverings
   d) fire rated
   e) glass sliding
   f) size of opening
   g) special uses
      i) barrier free (handicapped)
      ii) passage way
      iii) freight etc.
      iv) door stops
      v) fire ratings
      vi) others

3. Determine the proper type of hardware to be used on the various applications, as per building codes and fire codes:
   a) rim mounted
      i) night latch
      ii) drop bolt (Jimmy Proof)
      iii) panic bars
      iv) dead bolts
         - all fire rated
   b) unilocks
      i) knob

        - ii) lever
        - iii) dead bolt
    - c) security strike
        - i) wood doors
        - ii) metal doors
    - d) reinforcement supports
    - e) coordinators
    - f) astragals
    - g) kick plates, etc.

III. Troubleshooting

1. Identify the special problems in various types of doors, frame material and applications of each.

IV. Installation (shop practical)
CAUTION: Be aware of hazards, asbestos and other fill material in solid core doors.

1. Demonstrate the ability to select the proper tools for the job.
2. Demonstrate the proper use of tools previously listed and from first period.
3. Demonstrate the safe use of tools (power and hand).
4. Demonstrate the ability to complete the installation in a safe and efficient manner.
5. Demonstrate the ability to complete the installation as per manufacturer's specifications.
6. Demonstrate the skill of good housekeeping techniques.

V. Verification

1. Demonstrate the ability to verify by:
    - a) sight method
    - b) key operation of lock mechanism
    - c) component operation of:
        - i) strikers
        - ii) hinges
        - iii) door closer
        - iv) other hardware items

VI. Inspection

1. Demonstrate the ability to prove workmanship will pass final inspection and is to the standard of manufacturer's specifications.

C. Office Furniture

I. Identification

1. Identify the various types of locking mechanisms used in offices and furniture:
    - a) furniture
        - i) desks
        - ii) file cabinets
        - iii) wall cabinets
        - iv) glass door cabinets
        - v) computers
        - vi) sliding glass doors
        - vii) freezers
        - viii) others
    - b) types of locks designed specifically for the furniture market
        - i) wafer
        - ii) pin

      iii) bit
      iv) tubular
      v) other

II. Theory

1. Describe the methods used for removal of various lock types.

2. Describe the complete workings of the lock assemblies as per manufacturer's exploded views.

III. Removal (practical)

1. Demonstrate the ability to remove the above named types of locks from their various uses.

IV. Evaluation

1. Demonstrate the ability to diagnose lock problems from symptoms given.

2. Demonstrate the ability to evaluate whether to repair or replace considering:
   a) time of repair
   b) cost of replacement
   c) combination of both

V. Repair

1. Demonstrate the ability to repair or recombinate to manufacturer's specifications.

VI. Re-Install

1. Demonstrate the ability to install in door assembly.

2. Demonstrate the ability to prove the installation is correct.

VII. Installation (new)

1. Demonstrate the ability to select the proper tools for the job.

2. Demonstrate the ability to properly and safely use the tools selected.

3. Demonstrate the safe use of tools (hand and power).

4. Demonstrate the ability to complete the installation in a safe and efficient manner.

5. Demonstrate the skills of good housekeeping.

VIII. Verification

1. Demonstrate that the installation is completed correctly and with:
   a) accuracy
   b) in time line
   c) in budget

D. Service Other Builder’s Hardware

I. Identification

1. Identify the various types or groups of hardware:
   a) hinges (all types)
   b) pivots
   c) handles (push/pull)
   d) weather strips (guards)
   e) thresholds
   f) sweeps
   g) mullions

- h) astragals
- i) door closers
- j) door stops
- k) others

II. Theory

1. Describe the theory of operation of the above list.

III. Removal (practical)

1. Describe and demonstrate the removal procedure of the above list.

IV. Repair (practical)

1. Describe and demonstrate the repair procedures.

V. Replace and new installation

1. Demonstrate all safety precautions previously taught in relation to tools.
2. Demonstrate the ability to complete the installation in a safe and efficient manner.
3. Demonstrate the skills of good housekeeping.

VI. Verification

1. Demonstrate that the installation is completed safely, correctly and with:
   - a) accuracy
   - b) in budget
   - c) in time lines

E. Door Closers (Basic)

I. Identification

1. Identify the various types of door closers:
   - a) pot style (traditional)
   - b) floor concealed
   - c) overhead concealed
   - d) stream line type
   - e) indoor concealed
   - f) other
2. Identify the types of connecting (arms) and their distinct operation:
   - a) hold open
   - b) fire link
   - c) parallel arm
   - d) cush stop
   - e) others
3. Identify the various accessories used with door closers:
   - a) closer mount plate
   - b) soffit plate
   - c) corner brackets
   - d) sex bolts
   - e) other
4. Identify the various types of special closers:
   - a) electro - mechanical
   - b) smoke check (detector)
   - c) for handicapped
     - i) delay

        - ii) assist (partial)
        - iii) automatic
    - d) others

II. Theory

1. Describe the past theory of operation of door closers.

2. Describe the operation of all previously listed closers.

3. Describe the types of linkage:
    - a) how they operate
    - b) how they differ
    - c) how they mount

4. Describe the different operations of special closers.

III. Adjustments

1. Describe the adjustment variations and sequences of the following:
    - a) arms
    - b) closing speed
    - c) latching speed
    - d) lack check adjustment
    - e) closer tensions
    - f) other minor external adjustments

2. Demonstrate the ability to complete all minor adjustments as previously listed.

IV. Verification

1. Demonstrate that all adjustments are complete as per manufacturer's specifications with:
    - a) accuracy
    - b) in budget
    - c) in time lines
    - d) safety

F. Open Secured Entry (Advanced)

I. Theory of operation

1. Review theory previously taught in first period.

II. Entry (advanced)

1. Demonstrate entry of locked doors, etc. by:
    - a) key or combination
    - b) picking
    - c) shimming (cheating latch)
    - d) spreading frame
    - e) weak points of hardware
    - f) tool application
    - g) key sight reading
    - h) impressioning
    - i) rapping

2. Demonstrate entry of:
    - a) incorrectly installed locks
    - b) damaged or vandalized
    - c) disconnected
    - d) binding doors and hardware
    - e) broken key

3. Demonstrate entry to various types of locking devices:
    a) mortise - rim
    b) panic exits
    c) narrow style door locks (Adams Rite)
    d) office furniture
    e) key in knob
    f) pin tumbler
    g) wafer
    h) others

SECTION THREE: .... MASTER KEYING (BASIC) .... 12 HOURS

A. Review

1. Review first period master keying.

B. Master Key Custom Planning

I. Theory

1. Comprehend and describe:
    a) key systems planning
    b) customer interview
    c) function of premises
    d) function of specific areas
    e) movement of people
    f) future expansion
    g) exceptions

II. Practical

1. Demonstrate the above subjects by role play customer - Locksmith.

C. Charting

I. Theory

1. Comprehend charting master key system:
    a) key schedule
    b) diagram a flow chart
    c) nomenclature
    d) check communications with customer

II. Practical

1. Demonstrate how to make schedule, flow chart and coding from role play information.

D. Coordination

I. Theory

1. Coordinate the job of who, what, where, when, why and how for:
    a) key I.D. stamping or marking
    b) key distribution

c) timing
d) people needed
e) tools needed
f) supplies needed
g) use of work sheets

II. Practical

1. Demonstrate the ability to plan these points as if you were to do the job from role play.

E. Structure of Progression

I. Theory

1. Comprehend the basic structure of total progression:
    a) key biting array
    b) progression procedures
    c) determining level of keys
    d) progress 64 change key codes
    e) progress codes when only knowing GGM and GM keys

II. Practical

1. Demonstrate the ability to progress 64 codes and use for role play exercise system.

SECTION FOUR: .... HIGH SECURITY LOCKS AND KEYS...24 HOURS

A. High Security Principles

I. Theory

1. Describe and comprehend the "why" of high security locking devices.

2. Describe the various factory key codes and how they can assist the Locksmith.

3. Describe what registered keys are.

4. Describe and comprehend the different levels of key control.

II. Concepts

1. Describe the "how and why" various manufacturer's locks are pick resistant and control duplication.

2. Describe the variations of the following locks that puts them in the realm of high security:
    a) Medeco
    b) Miwa
    c) Abloy
    d) Kaba
    e) Emhart
    f) Assa
    g) Primus
    h) Sargent Keso
    i) Fischet
    j) Winfield
    k) Multilock
    l) others

III. Duplication

1. Describe the handling procedure(s) for duplication and making of keys.
2. Be aware of manufacturer's contracts (standards).
3. Describe the factory code and how it operates.

IV. Pick resistance

1. Describe the various items that make locks pick resistant:
    - a) angle cuts of keys
    - b) off set pins
    - c) dual set of pins
    - d) magnetic
    - e) side bar

V. Physical characteristics

1. Describe the physical characteristics of high security locks:
    - a) drill resistant
        - i) hardened inserts
    - b) be able to comprehend U.L. labels

VI. Key machines

1. Describe the theory of operation of the various special key cutting machines.
2. Describe the special pin kits required for high security locks.

B. High Security Practical

1. Demonstrate the ability to generate keys for the following lock cylinders:
    - a) Medeco
    - b) Miwa
    - c) Abloy
    - d) Kaba
    - e) Emhart
    - f) Assa
    - g) Primus
    - h) Sargent Keso
    - i) Dom
    - j) Mul-T-Lock
    - k) others

SECTION FIVE: .... AUTOMOTIVE .... 120 HOURS

Special Note: Due to the rate of change in the automotive area of locksmithing, information in the subject should be limited to that which is relevant to vehicles produced within the past twenty years.

A. Automotive Lock Servicing

Describe:

1. Ethical and legal considerations.
2. Design concepts:
   a) key/lock mechanisms used in automotive lock systems
   b) keying concepts
3. Theft reduction design measures.
4. Electronic anti-theft systems.
5. Typical procedures for originating keys.
6. Door panel servicing:
   a) tools
   b) specialty fasteners
   c) linkage rods, cables, clips
   d) automotive door design concepts
   e) removing door cylinders

B. Vehicle Opening

I. Theory

Describe:

1. Proper procedure for obtaining authorization.
2. Overview of car opening.
3. Fundamentals of automotive door design.
   a) latch
   b) lock cylinder
   c) door handle
   d) interior release
   e) power door lock solenoid
   f) linkage/cables
4. Tools used.
5. Resource materials available.
6. Door-mounted inflatable restraints.

II. Practical

1. Use resource materials.
2. Open vehicles by the following methods:
   a) manipulate free-play pawl
   b) manipulate verticle lock rod
   c) manipulate horizontal lock rod
   d) manipulate vertical lock button from inside door

- e) use “under the window tool
- f) use plastic strip
- g) use fondue fork
- h) manipulate vent window latch
- i) read and decode visible key

C. Anti-theft Systems

I. Theory

Describe

1. Overview of the system operation.
2. Vehicle makes/models affected.
3. Service tools and equipment.
4. Service procedures.
5. Resource materials available.
6. Systems:
   - a) GM specific
     - i) VATS
     - ii) Passlock
   - b) Transponders
   - c) other manufacture’s deterrants

II. Practical

1. Read value to duplicate key.
2. Use diagnostic equipment to prigram and/or duplicate keys.
3. Use resource material.

D. Resource Materials

I. Discuss the available recource materials available to facilitate automotive lock service procedures.

1. Identify and describe key blank catalogues
2. Identify and describe key black references
3. Identify and describe code books and databases
4. Identify and describe car opening manuals
5. Identify and describe automotive reference listings
6. Identify and describe OEM and after-market lock/parts catalogues
7. Identify and describe automotive jobber service manuals.
8. Identify and describe internet resources

E. Automotive Service Procedures

I. Discuss the lock service procedures in item 1 as they apply to vehicle makes/types in item 2.

Describe procedures:

1. Originate keys:
   a) make key to code
   b) use progression methods
   c) impression
   d) use decoder tools
   e) exploit vehicle make/model specific traits
2. Re-key locks.
3. Remove/reinstall locks:
   a) ignition locks
   b) door locks
   c) compartment and accessory locks
4. Remove broken key.
5. Service malfunctioning lock mechanisms:
   a) common malfunctions as they pertain to specific makes
   b) make/model specifice malfunctions.
6. Repair locks.
7. Disable inflatable restrain systems to facilitate service procedures.
8. Use resource material to facilitate service procedures.

II. Vehicle makes/types

1. Domestic makes:
   a) Ford
   b) General Motors
   c) Chrysler
   d) Saturn
2. Asian imports.
3. European imports.
4. British imports.
5. Scandinavian imports.
6. Transport trucks.
7. Heavy equiment.

III. Practical

1. Perform the full complement of service procedures on each of the makes/types listed above.

F. Motorcycle, Marine Craft and Recreational Vehicles

I. Theory

Describe:

1. Motocycle lock:
   a) types

- b) applications
- c) operation
- d) key code anomalies
- e) resource material available

2. Marine craft:
    - a) lock types
    - b) key codes and keying procedures

3. Recreational vehicle:
    - a) lock types

G. Automotive Specialty Items

1. Describe after-market anti-theft products:
    - a) Operation
    - b) Service procedures

2. Items:
    - a) commercial trailer lick (king pin lock)
    - b) locking gas cap
    - c) ”club”
    - d) “cane”

THIRD PERIOD TECHNICAL TRAINING
LOCKSMITH TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS COURSE THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: ....ELECTRICAL THEORY..66 HOURS

A. Principles of Electricity

I. Electron theory

   I. Differentiate between conventional current and electron flow.

II. Generation of E.M.F.

   1. Describe the methods used to generate AC and DC.
   2. Describe AC rectification and filtering.
   3. Describe the relationship between cycles, poles and frequency.

III. Electrical units

   1. Define quantity, express symbols and units of measurement for the following electrical terms:
      a) volts - voltage
      b) amperes - current
      c) ohms - resistance
      d) watts - power

IV. Insulators

   1. Define insulators with reference to electricity.

V. Ohm's law

   1. Describe the relationship of voltage, current and resistance in an electric circuit and apply Ohm’s law.
   2. Solve problems using Ohm's law.

VI. Electrical code(s)

   1. Explain the use, purpose and interpretation as applies to the Locksmith trade.

VII. Electrical drawings (schematics)

   1. Explain the use, purpose and interpretation of symbols on schematic drawings.

VIII. Electrical circuits

   1. Analyse and explain series and parallel circuits and identify their applications.
   2. Apply Kirchoff's current and voltage laws to circuit.
   3. Solve problems involving series, parallel and series/parallel.
      a) balanced
      b) unbalanced
      c) open neutral

4. Connect and take measurements of series and parallel circuits using schematic and wiring diagrams to verify Ohm's law.
    - e) lineloss
    - f) voltage drop

IX. Conductors

1. Define conductor with reference to electricity.
    - a) copper
    - b) aluminum

2. Recognize wire sizes (AWG or SI).

X. Semi-conductors

1. Define semi-conductors with reference to electricity.

XI. Power, mechanical and electrical.

1. Define work, energy and power.

2. State the units of work, energy and power.

3. Calculate electrical power.

4. Calculate mechanical power and work.

XII. Torque

1. Define torque.

B. Magnetism

I. Magnetic field and lines of force

1. Describe the characteristics of magnetic lines of force.

II. Magnetic attraction and repulsion

1. State the laws of magnetic attraction and repulsion.

2. Describe the field around a current carrying conductor.

III. Electromagnetic induction

1. Describe electromagnetism.

2. State Faraday's law of induction.

3. State Lenz's law of induction.

IV. Transformer action

1. Describe self-induction in a coil.

2. Describe inductive feedback and diode action.

3. Describe inductive reactance.

4. Describe mutual induction in a coil.

5. Outline the relationship between current and magnetism.

V. Solenoid action

1. Describe the electric, magnetic and mechanical action of solenoids.

C. Electrical Measuring Devices

I. Meters

1. Understand the principles of meter movements.

II. Use, care and safety operation of meters

1. Describe the proper care and safety precautions for digital meters.

D. DC Circuits

I. Series

1. Describe and define DC circuits in the following applications:
   - a) series
     - i) current
     - ii) resistance
     - iii) voltage drops
     - iv) power in series circuit
     - v) equivalent circuits
       - -rectifiers
       - -bridge rectifiers
       - -diodes
     - vi) analysis
     - vii) effects of open and short circuits

II. Parallel

1. Describe and define DC circuits in the following applications:
   - a) parallel
     - i) common voltage
     - ii) branch currents
     - iii) total current
     - iv) total resistance
     - v) conductance in parallel
     - vi) power in parallel circuits
     - vii) drawing parallel circuits
     - viii) equivalent circuits
     - ix) effects of open and short circuits

III. Series/parallel

1. Describe and define DC circuits in the following applications:
   - a) series/parallel
     - i) calculate total resistance
     - ii) current division
     - iii) voltage division
     - iv) total power
     - v) analysis of series-parallel
     - vi) equivalent circuits
     - vii) Kirchoff's law
     - viii) calculate voltage to reference points
     - ix) open and short circuits

E. DC Sources

I. Cells and batteries

1. Define the voltage, current capacity and rating applicable to batteries.
2. Describe the hazards associated with the checking and charging of applicable type batteries.
3. Explain voltage and current changes when batteries are interconnected.
4. Describe the proper care and maintenance of application type batteries.
5. Describe series and parallel connections for voltages and currents using batteries.

F. Electrical Lab

1. Overview

1. Demonstrate the proper use of test instruments using various types of digital meter.
2. Connect the basic circuit for:
    a) series
    b) parallel
    c) series/parallel
3. Measure volts, amps, ohms and explain their relationships as applies to Ohm's law and Kirchoff's law.
4. Identify shorts, opens and grounds.
5. Identify circuit diagrams and be able to determine appropriate current flow and voltage in different parts of series and parallel circuits given resistance and source voltage.
6. Recognize material as insulator of conductors and describe its function in the circuit.
7. Explain and test circuit overcurrent devices.
    a) fuses
    b) fusible link
    c) circuit breaker
8. Describe the operation of each circuit protector device and the safe and proper methods used to replace each device.

SECTION TWO:.................................ELECTRICAL COMPONENTS AND HARDWARE.......................................74 HOURS

A. Electrical Components

I. Theory

1. Identify the following components and the theory of electrical operations and applications:
    a) electric strikes
    b) electro magnetic locks
    c) keyless entry pads (card readers)
    d) rectifiers
    e) solenoids
    f) electronic mortise locks
    g) electronic dead bolts
    h) electronic knob set
    i) door exit alarms
        i) battery operated
        ii) hard wired
    j) power supply transformers

- k) current transfer units
    - i) electrified hinges
    - ii) door loop
    - iii) others
- l) relays
- m) time clocks
- n) switches (types)
    - i) key
    - ii) single pole
    - iii) single pole double throw
    - iv) double pole
    - v) double pole single throw
    - vi) double pole double throw
    - vii) others
- o) switches (uses)
    - i) normally open
    - ii) normally closed
    - iii) common
- p) lithium batteries
    - i) uses
    - ii) limitations
- q) fuses
- r) circuit breakers
- s) wall magnets and electronic door closers (hold open)

4. Identify and describe wire and its uses by:
    - a) size (gauge)
    - b) insulated
    - c) shielding
    - d) bare (grounding)

5. Describe various methods of connections:a) butt connectors
    - b) marrettes (marr connectors)
    - c) soldering
    - d) terminal blocks
    - e) solder less and approved tools used for applications
    - f) taped splices

6. Identify wire coding for terminal destination by:
    - a) numbering
    - b) lettering
    - c) ringout

II. Appropriate building codes as relates to electrical components for the Locksmith trade

1. Review the building code as it pertains to Locksmith work.

2. Interpret the building code as it pertains to the application of electrical hardware:
    - a) fail safe
    - b) nonfail safe

III. Practical

1. Demonstrate the ability to follow simple shop drawings for:
    - a) selecting proper wire
        - i) size
        - ii) insulations/temperature ratings
    - b) connecting wire connections
    - c) connecting simple circuits
    - d) testing simple circuits for
        - i) resistance
        - ii) current flow
        - iii) voltage

2. Demonstrate the ability to connect the various components required and in proper sequence to operate in lab situations:
    - a) electric strikes
    - b) electro magnetic locks
    - c) time clocks
    - d) remote switches
    - e) time delay
    - f) push button locks
    - g) card readers
    - h) others

IV. Hardware identification

1. Identify and describe the idiosyncrasies of name brand equipment:
    - a) Adams Rite
    - b) Folger Adams
    - c) Trine
    - d) Edwards
    - e) Rofu
    - f) Von Duprin
    - g) other

B. Practical (Electrical Hardware)

I. Installation (lab) (shop projects)

1. Describe and demonstrate the proper installation procedures for the following hardware and their allied components in metal, wood or other building materials:
    - a) electric strike
    - b) electromagnetic locks and hold opens
    - c) keyless entry pads
    - d) electronic mortise locks
    - e) electronic dead bolts
    - f) electronic knob sets
    - g) door exit alarms
    - h) time clocks
    - i) remote switches
    - j) time delay
    - k) push button locks
    - l) card readers (stand alone)
    - m) transformers
    - n) current transfer units
    - o) others

II. Troubleshooting

1. Demonstrate the ability to diagnose and troubleshoot problems that may occur in the previous systems studied.

III. Repair/replacement

1. Demonstrate the ability to repair/replace the various systems and components by:
    - a) repair
    - b) replacement
    - c) general servicing

SECTION THREE: ....DOOR CLOSERS (ADVANCED INSTALLATIONS)......................................18 HOURS

A. Review

1. Review second period theory.
2. Review adjustments.

CAUTION: Be aware of solid-core doors that may contain asbestos.

B. Installations

I. Theory

1. Describe and identify the various types of door closer mountings:
    a) handed single acting (surface mounted)
        i) regular
        ii) top jam
        iii) parallel arm
    b) non-handed single acting
        i) regular
        ii) top jam
        iii) parallel arm
    c) concealed in door
    d) concealed over head (header)
    e) conceled in floor mount
    f) others
2. Identify and describe the hand of the door for proper closer action.
3. Describe and identify the degree if door opening required and the proper selection of closer to use.
4. Describe and identify the controls required for the various openings, size and weight of doors:
    a) closing speed
    b) latching control
    c) back check
    d) specials (barrier free)
    e) others
5. Read and interpret building blueprints and specification sheet to determine the door closer required for the job.
6. Interpret and properly use hardware catalogues for ordering:
    a) closers
    b) correct linkages
    c) mounting brackets
    d) sex bolts
    e) other (hardware required)
    f) correct colour (if required)
7. Describe the function of a door coordinator and the conditions for which its use in mandatory.
8. Describe the various types of security hinges:
    a) retrofit hinges
    b) ball bearing hinges.
9. Describe the various levels of U.L.C. ratung and how they apply.

II. Practical

1. Install as per manufacturer's specifications.
2. Install as per hardware specification sheet.

3. Install with the aid of a template.

4. Select and install from cross reference if original manufacture is unavailable such as:
   - a) Briton (monarch)
   - b) Corbin
   - c) Dorma
   - d) L.C.N.
   - e) Norton
   - f) Russwin
   - g) Sargent
   - h) Yale
   - i) others

5. Mount on various types of door with proper mounting hardware:
   - a) metal
     - i) hollow core
       - -steel
       - -aluminum
   - b) wood
     - i) solid (various fills)
     - ii) hollow core
   - c) glass
   - d) all of the above fire rated

III. Troubleshooting

1. Troubleshoot for the mojor problems that occur; such as:
   - a) broken or bent linkage
   - b) linkage out of alignment
   - c) broken internal parts
   - d) broken springs
   - e) loss of fluids
     - i) seals
     - ii) cracks
     - iii) broken case
   - f) adjustments (in fluid chamber)

2. Identify and correct improper installations

IV. Retrofitting

1. Demonstrate the ability to retrofit closer mountings by:
   - a) remounting
   - b) use of new sex bolts
   - c) redrilling
   - d) use of mounting plates
   - e) use of proper fastening devices
   - f) other

V. Verification

1. Demonstrate the ability to verify all installations as to manufacturer's specifications.

2. Demonstrate the ability to verify all repairs as to correct procedures and specifications.

SECTION FOUR: .... MORTISE LOCKS (ADVANCED INSTALLATIONS).......................................25 HOURS

A. Mortise Locks

I. Theory

1. Review first period theory.
2. Identify and describe the differences of the various manufacturers:
   - a) Adam Rite
   - b) Schlage
   - c) Baldwin
   - d) Von Duprin
   - e) Corbin
   - f) Monarch
   - g) Sargent
   - h) Yale
   - i) others
3. Interpret and properly use hardware catalogues for ordering.
4. Describe and identify all working parts and their function in relation to each other in a mortise lock.

II. Installation (practical)

1. Demonstrate the ability to make the proper layout.
2. Demonstrate the ability to correctly use a template.
3. Demonstrate the ability to safely and correctly use a special router with mortise attachments to complete the cut-out.
4. Demonstrate the ability to make all the necessary mortise cuts, using hand tools and template.
5. Demonstrate the ability to install locking mechanism.
6. Demonstrate the ability to check for proper operation.

III. Troubleshooting

1. Demonstrate the ability to troubleshoot the various problems that can occur in mortise locks:
   - a) strike plate installed incorrectly
   - b) trim incorrectly installed
   - c) wrong handlock installed
   - d) bent latch bolts
   - e) bent dead bolts
   - f) others

IV. Repair

1. Demonstrate the ability to disassemble.
2. Demonstrate the ability to make the necessary repairs to put the door back in proper operation.

SECTION FIVE: .... PANIC BARS (VERTICAL MOUNT) ....18 HOURS

A. Vertical Mount

I. Theory

1. Review first period theory on panic bars.

2. Describe the workings of panic bar operations:
   - a) normal
   - b) vertical rod
     - i) surface mounting
     - ii) concealed mounting
     - - Adam Rite
     - - Schlage
     - - Von Duprin
     - - Corbin
     - - Monarch
     - - Sargent
     - - Yale
     - - others

II. Installation (practical)

1. Demonstrate the ability to make the proper layout.

2. Demonstrate the ability to correctly use a template.

3. Demonstrate the ability to make the proper mounting for:
   - a) surface mounting
   - b) concealed mounting

4. Demonstrate the ability to make all final adjustments.

III. Verification

1. Demonstrate the ability to check for complete, proper and safe, secure operation.

IV. Troubleshooting

1. Demonstrate the ability to troubleshoot the various problems that can occur in panic bar installations or malfunctions:
   - a) vertical rod
     - i) surface mounting
     - ii) concealed mounting

2. Demonstrate the ability to diagnose, locate and correct:
   - a) adjustment of vertical rods
   - b) operation and adjustment of top and bottom latch assemblies
   - c) binding cross bars
   - d) bent or broken internal linkage
   - e) adjustment of allied hardware
   - f) other faults

SECTION SIX: .... MECHANICAL KEYLESS LOCKS...15 HOURS

A. Theory

I. Theory

1. Describe the theory of operation in some detail of the various types, i.e.:
   - a) Unican
   - b) Simplex
   - c) Digital
   - d) Presomatic
   - e) recombinate padlocks (Sesame)

II. Installation (theory)

1. Describe the various installation procedures.
2. Describe the tools required for installation.
3. Describe how to use factory templates.
4. Describe how to complete an installation.

B. Practical

I. Installation

1. Demonstrate the ability to follow manufacturer's instructions.
2. Demonstrate the ability to use the tools required in a safe and efficient manner.
3. Demonstrate the ability to use the manufacturer's template(s).
4. Demonstrate the ability to complete installations of the locks previously listed.
5. Demonstrate the ability to:
   a) set combinations
   b) change combinations
6. Demonstrate the ability to change hand of lock as required.

II. Verification

1. Demonstrate the ability to verify:
   a) installation procedures
   b) correct operation for the above mentioned locks

III. Troubleshooting

1. Demonstrate the ability to troubleshoot all mechanical keyless locks. Examples to follow:
   a) Unican locks
      i) broken handle return spring
      ii) defective combination chamber
      iii) worn clutch assembly
      iv) worn or defective latch bolt
   b) Digital locks
      i) defective combination assembly
      ii) defective latch bolt
      iii) defective retractor assembly
   c) Simplex locks
      i) handle return spring
      ii) clutch assembly
      iii) scrambled combination chamber
   d) Presomatic locks
      i) combination plates
      ii) latch bolt assembly
      iii) retractor assembly

IV. Repairs

1. Demonstrate the ability to make repairs to the various types of locks previously stated:
   a) on the door
   b) on the bench
2. Demonstrate the ability to unscramble the combination chamber and set new combination.
3. Demonstrate the ability to complete servicing:

  - a) cleaning
  - b) lubricating
  - c) recombinating

V. Verification

1. Demonstrate the ability to verify:
   - a) repairs
   - b) replacement parts
   - c) modification
   - d) maintenance procedures
   - e) combination changes

SECTION SEVEN: .... MASTER KEYING (ADVANCED) ....24 HOURS

A. Advanced Master Key System

I. Review

1. Review previous theories taught in first and second years.

II. Progression

1. Understand the theory of progression.
2. Expand on:
   - a) master key levels
   - b) columns vs. row masters
   - c) 3-dimensional aspects
3. Demonstrate the ability of progression through progressing numbers.
4. Demonstrate the ability to apply keying schedule from year two.
5. Demonstrate the ability to select keys from progression.

III. Exceptions

1. Identify exceptions for difficult situations.
2. Demonstrate the ability to solve problems for difficult situations.

IV. Other means

1. Describe other means of progression:
   - a) matrix
   - b) computer
   - c) pyramidal
   - d) other

V. Comparison

1. Describe total progression and rotating constant:
   - a) advantages
   - b) disadvantages
   - c) combination of both
   - d) piacentric

VI. Decoding

1. Describe how to decode an existing key system from:
   - a) operating keys

  - b) master key
  - c) lock cylinders

2. Demonstrate the ability to decode by working through examples.

VII. Other types

1. Describe master keying of other types, i.e.:
   - a) Best I.C. core
   - b) Schlage wafer
   - c) Medeco
   - d) Dom 10 pin
   - e) Miwa
   - f) others

VIII. Key control

1. Describe and comprehend how to organise record keeping for customers:
   - a) keys to people
   - b) key to doors
   - c) who should keep records

FOURTH PERIOD TECHNICAL TRAINING
LOCKSMITH TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS COURSE THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: .... OXYACETYLENE...30 HOURS

The instruction under this section shall not be to the level of proficiency of a skilled Welder. The intent is to train the apprentice to a level where he may operate the required equipment in a safe proficient manner.

A. Oxyacetylene Equipment

I. Gases

1. Identification, characteristics, composition and handling precautions of the following gases:
   a) oxygen
   b) acetylene
   c) propane
   d) butane

II. Cylinders and fittings

1. Identify and describe each of the fittings by:
   a) colour
   b) thread
   c) special I.D. marks (notched fittings)
2. Identify and describe the construction details of the following cylinders:
   a) oxygen
   b) acetylene
   c) content of acetylene
   d) propane

III. Regulators and hoses

1. Identify and describe:
   a) basic construction of function
   b) precautionary handling and maintenance procedures
   c) installation procedures and precautions
   d) identification of hoses
      i) colouring
      ii) threads
   e) care and handling of hose(s)
   f) detection of leaks
      i) methods
      ii) precautions

IV. Torch

1. Recognition of parts terminology.
2. Function of torch components.
3. Recognition of tip sizes and types.

4. Care and storage of torch and tips:
    a) cleaning methods

5. Recognition of torch malfunctions:
    a) back fires
    b) flash back
    c) overheating
    d) incorrect mixture

6. Prevention and correction of malfunctions.
    a) balancing procedures

7. Types of flame and their application:
    a) carbonising
    b) neutral
    c) oxidising

V. Cutting and heating attachments

1. Component recognition and terminology.

2. Care and handling.

3. Attaching procedures and precautions.

VI. Basic techniques

1. Introduction to heating:
    a) interpretation of metal colour
    b) recognition of the effect heat has on metal

2. Introduction to cutting:
    a) recognition of "cutable" metals
    b) recognition of suitable flame
    c) interpretation of the cutting process
    d) operational procedures and precautions
    e) specific safety procedures, eye and face protectors, fire extinguishers
    f) preliminary precautions

VII. Brazing and silver soldering

1. Describe the theory of adherence.

2. Describe and demonstrate the preparation of material.

3. Identify the purpose of flux.

4. Identify the type of fluxes.

5. Demonstrate the proper sequence of start-up and shut-down of oxyacetylene torch.

6. Demonstrate the methods of adherence.

7. Demonstrate the removal of flux.

B. Metal Gas Arc Welding (GMAW)

I. Produce welds to an industry acceptable standard.

1. Assembly and operate GMAW welding equipment.

2. Produce industry acceptable welds.

3. Recognize and identify weld faults.

SECTION TWO .... SAFE DEPOSIT BOXES .... 30 HOURS

A. History

I. Background

1. List reason(s) for having a safe deposit box.
2. Identify where safe deposit boxes are located:
    - a) banks
    - b) hotels
    - c) independent vaults
3. Identify some of the public misunderstandings of safe deposit boxes.
4. Explain the banks:
    - a) liability
    - b) security
    - c) procedures towards Revenue Canada
    - d) rules for using safe deposit boxes
    - e) policy for opening by Locksmith
        - i) drilling
        - ii) pulling
        - iii) punching
    - f) reason for 2 keys to customer

B. Theory

I. Nest

1. Describe what is a nest of safe deposit boxes.
2. Outline and name all parts and how they relate to each other.

II. Safety deposit boxes

1. Describe the safe deposit box by:
    - a) sizes
    - b) type of locks
        - i) single nose
        - ii) double nose
        - iii) key change
        - iv) other
    - c) manufacture used in Canada
        - i) Chubb
        - ii) Corbin
        - iii) Diebold
        - iv) A.S.P.
        - v) S & G
        - vi) others
2. Identify and describe the design and construction of the various types of safe deposit boxes used in Canada.

III. Identification

1. Identify the various keys as per manufacture and their function:
   a) renters key
   b) preparation key
   c) factory coding
   d) restore key

2. Identify the various types of locks and describe their differences and function.

IV. Parts

1. Identify the various parts in the exploded view for each type of lock used in safe deposit boxes.

V. Tools

1. Demonstrate the tools required and the proper usage for safe deposit box disassembly.

VI. Theory

1. Describe each of the parts previously shown and their operation.

2. Describe the function of each of the parts identified.

3. Describe the application of each part and the relationship to each other.

4. Describe the differences of types of lock cylinders and how they accomplish a similar function.

VII. Shop practice

1. Demonstrate the ability to disassemble in sequence as per manufacturer's exploded views.

2. Demonstrate the ability to identify the various parts.

3. Demonstrate the function of each of the parts and components.

4. Demonstrate the assembly sequences.

5. Demonstrate the ability to complete the above objectives on the safe deposit box locks previously mentioned.

VIII. Verification

1. Demonstrate the ability to verify previous shop practice of disassembly and assembly.

C. Keys

1. Renters keys (manufacture)

   1. Demonstrate the ability to make original keys to fit locks by:
      a) hand
      b) machine

   2. Demonstrate the ability to complete the above mentioned using depth keys or code machine.

2. Duplication (practical)

   1. Demonstrate the ability to properly duplicate safe deposit box keys with correct stamping of numbers.

3. Preparatory keys

   1. Describe and demonstrate how preparatory keys operate.

   2. Describe problems with defective preparatory keys.

   3. Demonstrate the ability to set up lock for proper preparatory key operation.

4. Demonstrate the ability to verify preparatory key operation.

4. Restore key
    1. Describe and demonstrate the purpose of a restore key.
    2. Demonstrate the ability to make a restore key using previous methods taught.

D. Opening of Safe Deposit Boxes

I. Theory

1. Verify the proper box to be opened (communication).
2. Describe the various methods a Locksmith must know and may be required to demonstrate to open safe deposit boxes:
    a) drilling
        i) one hole method
        -fence
        -bolt
        ii) 3 hole method
        -screws
        iii) pulling
        iv) punching
3. Describe the use of templates for drilling.
4. Describe how to make templates.
5. Describe the tools required for pulling.
6. Describe the pulling process.

II. Practical

1. Demonstrate the ability to make templates for drilling.
2. Demonstrate the safe and proper use of tools required for opening safe deposit boxes.
3. From a set of locks and doors supplied, demonstrate the proper method and sequence of drilling safe deposit locks using template(s) previously made.
4. Demonstrate the proper method and use of pulling tools without inflicting excessive damage to the lock assembly.
5. Demonstrate the opening of the safe deposit box after the drilling or pulling is complete.

E. Repair (Locks)

I. Lock repair

1. Demonstrate the ability to make repairs to the safe deposit lock after opening by:
    a) drilling
    b) pulling
2. Demonstrate the ability to repair door after drilling by:
    a) welding (brazing)
    b) plugging
    c) sanding and painting
3. Review brazing practices.
4. Demonstrate the ability to repair, replace or resecure door stops and striker plates.

II. Hinges

1. Demonstrate the ability to repair or replace broken hinges.
2. Demonstrate how to adapt blank hinge stock to door.

F. Installations

I. Install

1. Demonstrate the proper method of installing a safe deposit lock on the door.
2. Demonstrate the ability to fit door to safe deposit boxes.
3. Demonstrate the ability to adjust door for safe deposit boxes.

G. Verification

1. Demonstrate the ability to verify all work completed:
   - a) lock removal (repair)
   - b) drilling (repair)
   - c) key working in lock
   - d) door and hinge repairs

H. Troubleshooting

1. Describe some of the tricks of the trade:
   - a) how to open when keys are available and horn is correct but won't open
   - b) how to open with prep key problems
     - i) worn key
     - ii) miscut key
     - iii) prep levers worn
     - iv) binding levers
     - v) bent levers
   - c) binding bolt
   - d) removal of broken keys
   - e) jammed doors
   - f) other open up problems

SECTION THREE: .... SAFES AND VAULTS .... 40 HOURS

A. History

I. Evolution

1. Describe the evolution of safes and vaults over the past 300 years.
2. Describe the evolution of safe key locks.
3. Describe the evolution of safe combination locks.

II. Service technician

1. Describe the following procedures:
   - a) professional ethics
   - b) conduct
   - c) appearance

    - i) dress
    - ii) deportment
  - d) knowledge of bank or customer rules
  - e) diplomacy
  - f) demonstrate to the customer, confidentially
  - g) provide technical support

B. Safety Precautions

1. Recognize possible hazards that may be enclosed within the safe storage of:
   - a) explosives
   - b) tear gas
   - c) chemicals
   - d) drugs (booby traps with explosives set to protect illegal drugs)

NOTE: This is a most important area of learning as there are recorded cases of Locksmiths being killed while not using proper care and knowledge.

2. Recognize possible physical hazards:
   - a) broken hinges
   - b) handling of safe doors
   - c) movement of heavy safes
   - d) men and equipment
   - e) building structural capacities
   - f) other unknown factors

C. Design and Construction

I. Design (theory)

1. Describe the differences in design capabilities for:
   - a) burglar resistant safes and vaults
   - b) fire resistant safes and vaults
   - c) combined burglar and fire resistant safes
   - d) media safes
   - e) floor safes

2. Describe the design capabilities required for safes and vaults.

3. Describe the design requirements for various vaults:
   - a) record vaults
   - b) built in place security vaults
   - c) porta-vaults
   - d) unitised (modular) vaults

4. Describe how vaults must be designed to meet specific insurance specification ratings.

5. Describe how vaults are to be built to incorporate alarm systems.

II. Construction (theory)

1. Describe the various construction techniques required to construct the previously listed types of safes and vaults.

2. Describe the many varied types of materials and construction methods that can be used to construct different types of safes and vaults:
   - a) steel
   - b) insulation materials
   - c) hard plate
   - d) cements and mortars
   - e) modular vault panels

    f) others

3. Describe the construction of safe and vault doors for:
    a) burglary resistant safes and vaults
    b) fire resistant safes and vaults
    c) combination of burglar and fire safes and vaults
    d) media safes

4. Describe the construction of selected antique safes and vaults still found in service:
    a) J.J. Taylor
    b) Mosler
    c) Halls
    d) Pittsburgh
    e) Cannonball
    f) Diebold
    g) others

III. Door components (theory)

1. Describe the components that make up a safe and vault door.

2. Describe all the individual components as they relate to fire or burglary.

3. Describe how the various parts relate to each other.

4. Identify and name all parts in a safe door.

D. Labels and Rating (Theory)

I. Ratings

1. Identify and describe the various labels that may be available today:
    a) ULC Underwriter Laboratories of Canada (Canada)
    b) UL Underwriter Laboratories (USA)
    c) Sweden
    d) Japan
    e) insurance specifications
    f) others

2. Identify and describe the following ULC burglar safe labels:
    a) Residential safes
    b) TL-15
    c) TL 30
    d) TL-15X6
    e) TL-30X6
    f) TRTL-15
    g) TRTL-30
    h) TRTL-15X6
    i) TRTL-30X6
    j) TRTL-60X6

3. Identify and describe the following Insurance Advisory Organisation (IAO) classifications:
    a) Class 1
    b) Class 2
    c) Class 3
    d) Class 4
    e) Class 5

4. Identify and describe the following ULC fire rated safe labels:
    a) Class A
    b) Class B
    c) Class C
    d) Class D

5. Identify and describe the following ULC fire rated media safe labels:
   a) Class 125-1 hour
   b) Class 150-1 hour
6. Relate the comparisons and/or the differences between ULC labels and others.
7. Identify and describe the Canadian (ULC) labels for vaults.

II. Practical

1. Demonstrate the ability to:
   a) locate the labels
   b) identify special ratings of labels
   c) identify unlabeled safes for:
      i) quality
      ii) insurance purposes

III. Field trip

1. Make field trip to visualise the difference between types of vaults:
   a) locate the labels
   b) record vaults
   c) unitised vaults
2. Write a minor report on comparisons and differences that were observed during the field trip.

E. Bolt Works

I. Bolts (theory)

1. Identify the different types of bolt works.
2. Describe the purpose of bolt works.
3. Describe the operation of bolt works.
4. Identify and describe pressure bar systems and their operation.
5. Describe the operation of the interlocking cash safe door.

II. Practical

1. Demonstrate the ability to service and repair bolt works for:
   a) burglar safes
   b) fire safes
   c) combination fire and burglary safes
   d) media safes

F. Relocking Devices

I. Theory

1. Describe the purpose of relocking devices.
2. Describe the function of relocking devices.
3. Identify and describe the various types of relocking device trigger mechanisms:
   a) pin
   b) cable
   c) glass
   d) ceramic
   e) others

4. Define passive and active relocking devices.
5. Describe the locations of various relocking devices and their methods of operation:
    a) in locks
    b) beside locks
    c) others

II. Practical

1. Demonstrate the ability to service relocking devices.
2. Demonstrate the ability to repair relocking devices.
3. Demonstrate the ability to adjust relocking devices.
4. Demonstrate the ability to examine relock linkage connections for proper adjustments and operation.
5. Demonstrate the ability to manufacture and/or install relocking devices.

III. Verification

1. Demonstrate the ability to inspect and verify the relocks are set to manufacturer's specifications.

G. Hinges

I. Theory

1. Describe the various types of hinges.

II. Practical

1. Demonstrate the ability to service and lubricate hinges.
2. Demonstrate the ability to service and repair hinges.
3. Demonstrate the ability to make hinge bolt adjustments.
4. Demonstrate the ability to use hinge spacers and/or shims.
5. Demonstrate the ability to remove and replace hinges or hinge pins.
6. Demonstrate the ability to lift and remove a safe door in a safe and expedient manner.
7. Demonstrate the ability to replace and adjust a safe door.

H. Handles

I. Theory

1. Identify and describe the various types and sizes of handles.
2. Describe the operation of the handle shaft.
3. Identify and describe handle cams and their function.

II. Practical

1. Demonstrate the ability to remove and disassemble handles.
2. Demonstrate the ability to service handles and shafts.
3. Demonstrate the ability to reassemble and verify correct operation.
4. Demonstrate the ability to retrofit obsolete safe handles.

I. Moving

I. Theory

1. Estimate the weight of safes to be moved.
2. Identify the equipment that may be required to move safes.
3. Recognize and determine structural limitations of:
   a) floors
   b) stairways
   c) elevators
   d) carpets
4. Recognize considerations when moving safes equipped with wheels.
5. Determine when it is more expedient to use a professional mover.

II. Practical

1. Demonstrate the ability to move a 1 500 lb. (682 kg) safe with wheels.
2. Demonstrate the ability to move a 1 500 LB (682 kg) safe without wheels.
3. Demonstrate the ability to level a safe.

J. Vault Specifics

I. Alarms

1. Recognize alarm components on vaults and doors.
2. Ensure respect is given to the alarm system.
3. Recognize an alarm pad liner and its function.
4. Know when to call an alarm technician.

II. Emergency release mechanism

1. Identify emergency release mechanisms from exploded view diagrams.
2. Describe the operation of emergency release mechanisms.
3. Describe requirements for emergency release mechanisms and related signage.
4. Describe maintenance procedures required.
5. Demonstrate the ability to examine a security and record vault door for emergency release handle operation.
6. Demonstrate the ability to remove and disassemble as per manufacturer's instructions.
7. Demonstrate the ability to service emergency release mechanisms.
8. Demonstrate the ability to repair emergency release mechanisms.
9. Demonstrate the ability to reassemble emergency release mechanisms.
10. Demonstrate the ability to Recognize the parts of an emergency release mechanism and their functions.
11. Demonstrate the ability to verify that all work completed on the emergency release mechanism is performed to manufacturer's specifications.
12. Demonstrate testing for proper operation.

III. Vault ventilators

1. Describe the purpose of ventilators.
2. Identify ventilator in a vault.
3. Describe the principles of operation for ventilators.
4. Demonstrate the ability to service vault ventilators.
5. Demonstrate the ability to verify that the vault ventilator alarm is in proper working order

IV. Emergency vault entry door

1. Describe what an emergency vault entry door is.
2. Describe why the emergency door is required.
3. Describe where the emergency vault entry door may be located.

K. Doors and Frames

I. Theory

1. Identify how door frames fit to vault cavities.
2. Identify how doors fit to frames.
3. Identify how doors are hinged to frames.
4. Identify how doors and hinges are adjusted.
5. Identify what precautions must be adhered to when mounting doors to vaults.
6. Identify escape doors and their purpose.

II. Installation (theory)

1. Describe the proper procedure for installation.
2. Describe what equipment is required for installation.
3. Plan supervision of installation.
4. Describe how to level a security door.
5. Describe how to make ready for grouting.
6. Describe how to check for door run.
7. Describe how to correct for door run.

III. Practical

1. Demonstrate the ability to lift into place a 3½ inch (87 mm) security vault door and frame.
2. Demonstrate the ability to level the installed door and frame.
3. Demonstrate the ability to properly anchor and secure door and frame.
4. Demonstrate the ability to check for run at the door.
5. Demonstrate the ability to correct any door runs.
6. Demonstrate the ability to make door frames ready for grouting.

IV. Final set up

1. Demonstrate the procedure to check for proper opening and closing.

2. Demonstrate how correct opening and closing malfunctions.
3. Demonstrate how to correct binding doors in frame.
4. Demonstrate the procedure for checking proper operation of bolt work and adjust as required.
5. Demonstrate the procedure for checking proper operation of pressure bars.
6. Demonstrate the ability to adjust hinges.
7. Demonstrate the ability to correct the various types of binding that may occur.

L. Other Bank Equipment

I. Theory

1. Identify and describe the security equipment used in mercantile and bank operations:
    a) tellers lockers
    b) security safes
    c) Automatic Teller Machine (ATM) safe portion only
    d) night depository safes
    e) other specialised equipment

II. Practical

1. Demonstrate the ability to service, repair and maintain the locking devices in the above equipment.

SECTION FOUR: ....SAFE AND VAULT LOCKS..48 HOURS

A. Key Locks

I. Theory

1. Review of second year theory for:
    a) pin tumbler locks
    b) lever locks
    c) bit key locks
    d) disk locks (abloy)
    e) others
2. Describe the operation of the above locks as they apply to safes.

II. Practical

1. Demonstrate the ability to open these previously taught locks by:
    a) picking
    b) drilling
2. Demonstrate the ability to repair or replace locks.
3. Demonstrate the ability to make keys for safe key locks.

B. Combination Locks Identification

I. Theory

1. Identify and describe the different styles of combination locks:
    a) open gate
    b) roller bolt

    c) square bolt

2. Identify the common parts that the above combination locks have:
    a) dial and ring
    b) spindle
    c) spline key
    d) drive wheel
        i) direct drive
        ii) indirect drive
        iii) front drive
        iv) rear drive

3. Explain how the individual parts relate to each other.

4. Describe the theory of operation of the different styles of combination locks.

5. Identify and describe the hand for the mounting of locks on safe doors.

6. Identify and describe in detail the various locks that have been made by the following manufacturers:
    a) Chubb
    b) Sargent & Greenleaf
    c) Mosler
    d) La Gard lock
    e) Milner lock
    f) Yale
    g) others

II. Practical

1. Demonstrate the ability to identify various safe and vault combination locks.

2. Demonstrate the ability to operate various safe and vault combination locks.

C. Wheel Design

I. Theory

1. Identify and describe the various types of wheels.

2. Identify and describe the parts of a wheel.

3. Describe the operation of various types of wheels.

4. Describe how each wheel combination is changed:
    a) mesh change wheel
    b) screw change wheel
    c) key change wheel
    d) hole change wheel

D. Combination Locks Changing

I. Theory

1. Identify and describe how to make the combination changes on various types of locks manufactured by the following:
    a) Chubb
    b) Sargent & Greenleaf - 3 & 4 wheel
        i) key change
        ii) hole change
        iii) mesh change
    c) Mosler - 3 & 4 wheel
        i) key change

ii) mesh change
- d) La Gard lock - 3 & 4 wheel
- e) Hall
- f) Yale - 3 & 4 wheel
- g) Milner lock
- h) others

II. Practical

1. Demonstrate the ability to change the combination on the above named locks.
2. Demonstrate the ability to verify all combination changes are correct.

E. Combination Locks Servicing

I. Theory

1. Identify and describe in detail the servicing of the various locks by the following manufacturers:
   - a) Chubb
   - b) Sargent & Greenleaf
   - c) Mosler
   - d) La Gard lock
   - e) Milner lock
   - f) Yale
   - g) others

II. Practical

1. Demonstrate the ability to disassemble the above named combination locks as per manufacturer's sequence.
2. Demonstrate the ability to service these combination locks as per manufacturer's instructions.
3. Demonstrate the ability to reassemble as per manufacturer's sequences.
4. Demonstrate the ability to verify that all previous functions have been done correctly.

III. Verification

1. Demonstrate the ability to verify all practical work completed for proper operation of the combination lock.

F. Combination Locks Repair

I. Troubleshooting (theory)

1. Identify and describe some problems that may appear when you are required to troubleshoot a combination lock:
   - a) dial and dial ring problems
   - b) spline key problems
   - c) drive wheel problems
   - d) slipped wheels
   - e) loose wheels
   - f) binding wheels
   - g) loose mounting screws
   - h) jammed drop lever
   - i) worn or broken parts
   - j) improper setting of combinations
   - k) loose gear problems
   - l) operator problems
   - m) problems related to improper service
   - n) other related problems
2. Describe how to verify correct combinations.

II. Practical

1. Using the proper combination demonstrate the ability to solve combination lock lockouts.
2. Demonstrate the ability to repair and correct dial problems.
3. Demonstrate the ability to verify that corrections have been completed.
4. Demonstrate the ability to verify correct combination numbers.

G. Manipulation Proof Locks

I. Theory

1. Recognize and identify a manipulation proof combination lock.
2. Describe various methods of operation of manipulation proof locks.

II. Practical

1. Demonstrate the ability to disassemble, service and reassemble manipulation proof locks:
   a) Sargent and Greenleaf 66000, T8400 MP, 8550 MP
   b) La Gard 1980 ARL
   c) Diebold 180-32
   d) Mosler 120, 302
   e) Star-AMSEC (push in dial)
   f) Yale 073
   g) others
2. Demonstrate the ability to disassemble, repair, service, reassemble a Sargent and Greenleaf manipulation proof lock.

III. Verification

1. Verify the previous work was completed as to manufacturer’s specifications.
2. Demonstrate the ability to verify the combination working correctly.

IV. Troubleshooting

1. Demonstrate the ability to troubleshoot combination lock problems.
2. Demonstrate the ability to troubleshoot special malfunctions inherent to manipulation proof locks.

V. Repair

1. Demonstrate the ability to complete the repairs as per manufacturer's specifications previously mentioned and:
   a) malfunction of turn button
   b) malfunction of drive cam
   c) other specialised problems

H. Electronic Locks

I. Theory

1. Identify and describe types of electronic locks.

2. Describe electronic lock components and their relationships.

3. Describe proper operation as to:
   how to open
   how to change combination

4. Describe power sources used in electronic safe locks.

5. Describe problems common to electronic locks.

II. Practical

1. Demonstrate the ability to change batteries as per manufacturer's specifications.

2. Demonstrate the ability to change combinations.

3. Verify correct operation of electronic locks.

4. Demonstrate emergency open up procedures.

I. Time Locks

I. Theory

1. Describe time locks and their purpose.

2. Describe the operational function of time locks:
   a) mechanical types
   b) electronic types

3. Identify and describe how to check for overwind.

II. Practical

1. Deemonstrate the ability to install a two movement time lock and related linkage.

2. Demonstrate the ability to remove a two movement time lock.

3. Demonstrate the ability to repair time lock problems:
   a) overwind condition
   b) power loss or surge
   c) broken parts
   d) complete clock failure
   e) check locking bar
   f) check to ensure locking and unlocking
   g) other related problems

4. Demonstrate the ability to perform emergency open up procedures.

III. Verification

1. Demonstrate the ability to verify that all repair work has been completed to manufacturer's specifications.

SECTION FIVE: .... SAFE AND VAULT ENTRY .... 36 HOURS

A. Safe Entry (Theory)

I. Methods

1. Identify and describe the various methods of gaining entry:
    - a) combination
    - b) surreptitious entry
    - c) punching
    - d) peeling
    - e) drilling
    - f) cutting - oxyacetylene
    - g) cutting - grinding
    - h) explosives
    - i) thermal lance (burning bar)
    - j) plasma cutter
    - k) others
2. Describe the factors to consider in determining the correct method to be used for entry.
3. Recognize the various methods of entry to assist police or insurance companies.

Caution: You could be liable by giving this opinion, so insure that you have the depth of knowledge and experience.

II. Cautions

1. Recognize possible hazards that may be enclosed within the safe that you could encounter when opening a safe or vault:
    - a) storage of explosives
    - b) storage of tear gas
    - c) storage of chemicals
    - d) storage of drugs (booby traps with explosives set to protect illegal drugs)
2. Recognize possible physical hazards encountered when opening a safe or vault with damaged hinges or door.

Note: This is a most important area of learning as there are recorded cases of Locksmiths being killed for not using proper care and knowledge.

B. Troubleshooting Lockouts

I. Theory

1. Identify and describe troubleshooting of lockouts.
2. Describe what security management can protect against:
    - a) handles
    - b) bolt works
    - c) defective combination locks
    - d) relock devices
    - e) time locked stopped or jammed
    - f) other faults

II. Practical

1. Demonstrate the ablity to correct the faults that have been diagnosed.
2. Demonstrate the ablity to solve a lockout.
3. Demonstrate the ablity to complete service and repair to manufacturer's spefications.

III. Verification

1. Demonstrate the ablity to verify that all work has been completed to manufacture's spefications.

C. Safe Penetration

I. Theory

1. Explain the purpose and reasoning for penetration.
2. Determine what tools to use on what kind of safe:
   a) burglary safe
   b) fire safe
   c) media safe
3. Determine the following factors:
   a) when to drill
   b) where to drill
   c) why to drill
   d) how to drill
4. Determine which drill bits to use on various materials:
   a) steel plate
   b) hard plate
   c) relocking devices
   d) glass relocking devices
   e) ceramics
   f) others
5. Describe a Borescope:
   a) what is it used for
   b) how is it used
6. Describe how to remove or pull a dial.
7. Describe a pressure bar system and how to operate it:
   a) factory
   b) jerry rig

II. Practical

1. Demonstrate the ability to penetrate a safe by drilling.
2. Demonstrate the knowledge of:
   a) where to drill (measurements)
   b) size and type of drill bits to use
   c) selection of drill motor
   d) how to drill
   e) how far or deep to drill
3. Demonstrate the ablity to properly remove a dial.
4. Demonstrate the ablity to use a preesure bar system in a safe and efficient manner.
5. Demonstrate the proper use of a Borescope for:
   a) reading wheel gate opening
   b) diagnosing lock-outs

   - c) ocating relocking devices

D. Vault Penetration

I. Open up

1. Identify and describe the procedure(s) that may be used to gain access to a vault.
2. Identify and describe the tools and equipment that may be required to gain access to a vault:
   - a) jack hammer
   - b) coring machine
   - c) drills etc. (with carbide bits)
   - d) other tools
3. Identify and describe possible dangers when drilling:
   - a) electrical conduit
   - b) other materials

II. Practical

1. Demonstrate the ability to supervise the drilling or coring of vaults
2. Demonstrate the ablity to ensure security and confidentiality
3. Demonstrate the ablity to ensure all O.H. & S safety rules are followed.
4. Demonstrate the ablity to ensure that the repair procedure is completed to orginal or better standards.

SECTION SIX: .... NIGHT DEPOSITORY RECEIVERS.. 24 HOURS

A. Night Depository

I. Theory

1. Describe the uses of night depositories.
2. Indentify and describe the various types of night deposit safe receivers:
   - a) drop slots
   - b) rotary hopper type
   - c) drawer type
   - d) bank deposit type
   - e) letter slots
   - f) wallet hoppers
   - g) others
3. Identify and describe the various manufactures of night deposit safes:
   - a) Chubb – T, Q & C types
   - b) Diebold - Securematic
   - c) Diebold - Polaris
   - d) Americian – deposit heads
   - e) MGM – Drummond
   - f) Decurefort
   - g) Securetech
   - h) others
4. Identify and describe how to remove from wall mount.
5. Describe equipment needed for removal purposes
6. Identify and describe:
   - a) alarm connections
   - b) electrical connections

7. Identify and abide by any bank rules pertaining to liabilities relating to night deposit safes

II. Troubleshooting

1. Demonstrate the ability to examine for proper operation.
2. Demonstrate the ablity to troubleshoot for repairs that may be required.
3. Demonstrate the ablity to locate the lost deposits.

III. Practical.

1. Demonstrate the ablity to remove the following from wall mount:
    - a) Chubb – T, Q & C types
    - b) Diebold - Securematic
    - c) Diebold - Polaris
    - d) Chubb Citadel and Citadel II
    - e) Allied Gray
    - f) Securifort
    - g) Securetech
    - h) American
    - i) Others
2. Demonstrate the ablity to service the above named and other named equipment.
3. Demonstrate the ablity to repair all previously named equipment.
4. Demonstrate the ablity to install or reinstall any night deposit safes.
5. Demonstrate the ablity to ensure that all head switch alarms are reset properly.
6. Demomstrate the ablity to check alarm pads and repair as required.

IV. Verification

1. Demonstrate the ability to verify that all repairs and workmanship are completed to manufacturer's specifications.

SECTION SEVEN: .... CORRECTIONAL INSTITUTION LOCKS (JAILS)...................................... 12 HOURS

A. History

I. Evolution

1. Describe the evolution of institutional lock and security over the past centuries.

II. Rules

1. Describe, understand and obey the general rules for a Locksmith when working in a institutional setting:
    - a) proper identification for entry to jails, etc.
    - b) care and close control of tools
    - c) working with trusted prisoners
    - d) control and security of vehicles in jails
    - e) cleaning up and removal of all scrap materials at completion of job
    - f) verification of completed work
    - g) procedures for leaving jails

III. Terminology

1. Describeand identify specific terminology as to related to institutional locks:
    - a) man traps
    - b) sally ports

B. Theory

I. Basic principles

1. Describe the basic principles of operating for jail locks and locking controls:
    - a) mechanical lever
    - b) mechanical pin tumbler
    - c) electric controlled locks
    - d) pneumatic contolled locks
    - e) others

II. Types

1. Describe the basic types of locks used in jails.
2. Describe and explain the differences using manufacture's exploded view drawing for:
    - a) Folger Adams
    - b) Chubb
    - c) Southern Steel
    - d) Adtec
    - e) others

C. Related Hardware

I. Catalogues

1. Describe and demonstrate the ablity to use institutional lock catalogues.
2. Describe and demonstrate how to order:
    - a) related hardware
    - b) special mounting
3. Determine the hand of door and locks for ordering purposes
4. Determine and demonstrate the special ordering requirements when factory ordering lock parts and accessories.

D. Doors

I. Functions

1. Identify and describe the various models and functions of institutional doors and related hardware:
    - a) swinging doors
    - b) sliding doors
    - c) gang lock doors
    - d) remote override
    - e) door postion indicator switches
    - f) others

E. Security

I. Attachments

1. Identify and describe the various types of screws and bolts used on jail doors and related hardware:
    - a) break off
    - b) spanner
    - c) torx
    - d) others

2. Identify and describe the special tools and procedures required to use the special screws and bolts.

II. Mounting

1. Describe how jail locks are mounted:
   a) in door
   b) in frame

2. Describe how to remove locks from doors and frames:
   a) sliding
   b) swinging
   c) frame mounted
   d) others

F. Electric Strikes

I. Review

1. Review electric strikes and their operation from third period:

2. Review basic principles and methods of operation for
   a) Folger Adams
   b) Chubb
   c) Southern Steel
   d) others

II. Troubleshooting

1. Describe common problems that occur:
   a) lack of power
   b) broken springs
   c) other faults

G. Practical

I. Disassembly and assembly (school shop project)

1. Demonstrate the ablity to disassemble and assemble as per manufacturer's specifications and exploded views:
   a) jail lever lock
   b) Mogul lock cylinder
   c) Folger Adams electric strike

SECTION EIGHT: .... SECURITY MANAGEMENT (BASIC) ....20 HOURS

A. Theory

I. Purpose

1. Describe why security management is required.

2. Describe what security management can protect against:
   a) hazards
   b) damage or loss
   c) dishonesty
   d) espionage
   e) others

II. Risk

1. Describe and identify risk possibilities.
2. Identify and expose the risk:
    a) probability
    b) criticality

III. Security components

1. Describe how an organization can interrelate security components:
    a) physical security
    b) emergency and disaster
    c) fire protection
    d) guards
    e) investigations
    f) security of documents
    g) personnel safety

IV. Physical security

1. Identify and describe the following physical security components:
    a) alarms
    b) locks and safes
    c) windows
    d) security lighting
    e) fencing
    f) structural
        i) windows
        ii) doors
        iii) walls
        iv) skylights
    g) access control
    h) close circuit TV
    i) security layout of new buildings
    j) security survey of old buildings

V. Physical controls

1. Identify and describe the physical controls that can be implemented:
    a) protection plan
    b) cost effectiveness
    c) security plans

B. Practical

I. Workshop

1. Demonstrate the ability to conduct a security survey.
2. Given the floor plan of a commercial establishment, the apprentice will be able, in a role play interview, to determine the security requirements and identify the required hardware for the building.
3. Using the information obtained during the interview conducted in 2 and manufacturer's catalogues, the apprentice will be able to prepare a written schedule of security devices required for the building showing the product number, function, finish and manufacturer.
4. Using the information obtained during the interview conducted in 2 and the schedule prepared in 3, the apprentice will be able to prepare a written recommendation regarding the security requirements of the establishment and present the recommendation to the building owner in a role play.

5. The apprentice will be able to prepare a summary of the equipment and materials required to secure the above premises.

C. Public Safety

1. Identify and apply life safety codes, regulations and concerns:
    - a) residential
        - i) double cylinder dead bolts
        - ii) window bar
        - iii) alternate glazing
        - iv) fire separations
        - v) security requirments
            - hardware
            - framing
            - doorviewer
    - b) commercial / industrial
        - i) occupancies types
        - ii) 0fire separations
        - iii) exit aggress signs
        - iv) hardware requirements
        - v) physically challenged requirements
            - automatic door operators
            - locking hardwear requirements
            - barrier free closer
            - closers
            - exit devices (panic bars)
            - doors (asbestos – fire rated)
            - hinges / pivots
            - locking devices
        - vi) electrical hardware
    - c) automotive
        - i) air bags
        - ii) steering wheel locks
        - iii) door lock systems
    - d) security equipment
        - i) moving of equipment (safes/vaults)
        - ii) hazardous materials associated with safes
        - iii) proper installation
    - e) working safely in public
        - i) dust
        - ii) noice
        - iii) physical hazards
        - iv) cords
        - v) barriers
        - vi) respetory hazards

D. Workplace Coaching and Advisory Network

1. Describe the following coaching skills used for training apprentices:
    - a) identify the point of lesson
    - b) link the lesson
    - c) demonstrate a skill
    - d) provide opportunity to practice a skill
    - e) give feedback to learner
    - f) assess the learner's progress

2. Describe the role and purpose of the advisory network and the Provincial Apprenticeship Committee for the Locksmith trade.

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